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THE ORIGIN AND DEVELOPMENT OF NERVOUS DISTURBANCES EXPERIMENTALLY PRODUCED¹

By W. HORSLEY GANTT

*Pavlovian Laboratory, The Phipps Psychiatric Clinic, Johns Hopkins University,
Baltimore, Maryland*

HISTORY

The first experimental neurosis² produced in animals dates back a quarter of a century to the classical experiments of Pavlov made on the basis of his newly discovered method—that of the conditioned reflex. Like the discovery of the malarial treatment in dementia paralytica by two Russians in 1888—forty years before its general use—and the early reports of the use of sulphanilamid, these experiments of Pavlov attracted no attention until recently when they have been used by a good many workers in this country on various animals—from the rat to the primates. Pavlov showed that the disturbances in animals were manifested by an imbalance in the conditioned reflexes as well as by certain motor phenomena, and the workers in this country have been able to see in a variety of animals disturbances of behavior parallel to what Pavlov saw in dogs, e.g., Liddell in sheep, pigs and goats; Maier in rats; Masserman and Dworkin in cats, etc.

PRESENT WORK

In addition to the production of the so-called experimental neurosis, the credit for which should go to Pavlov, I have extended this study along three main lines:

I. The production of a chronic anxiety-like neurosis, more properly a state of imbalance situationally determined, produced in 1933, which has lasted now for eight years in one dog.

II. The early detection of the breakdown by measurements of autonomic functions (secretory, cardiac, respiratory, sexual) with

¹ Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Va., May 5-9, 1941.

² By the term neurosis no attempt is made to identify the state with what is clinically known by the same term. As experimental neurosis is the term introduced by Pavlov it is retained here.

the animal under artificial strain. Such measures may reveal a disturbance long before there is a demonstrable change in overt behavior.

III. A study of such a state of imbalance not only upon the CRs but the extension of this imbalance to involve many and various physiological systems—digestive, respiratory, circulatory, urinary, sexual, muscular activity as well as social relationships.

METHOD

The classical Pavlovian method was exposure of the animal to a difficult problem based upon a strong excitation. Practically this is carried out as follows: a strong food excitation is set up in a hungry animal; the giving of food is preceded by a signal over any receptor system so that the signal later acquires the function of producing the food excitation without the food—the conditioned food reflex. Next an inhibitory process is formed on the basis of the food excitation by some such method as the giving of a signal similar to the first one but always failing to reinforce it with food, until the animal reacts positively to the signal accompanied by food and negatively to the similar signal unaccompanied by food.

CONFLICT

The next step in the production of the nervous state is the conflict between the signal for the positive activity (excitation) and the negative (inhibition). This may be carried on to the point where the dog is unable to react correctly, to make a differentiation. For example we may use two tones so close together in pitch that the nervous system is physically incapable of discriminating—say 1000 as signal for food and 1012 as signal not accompanied by food. I shall omit discussion of the theoretical considerations—

whether the correct explanation is a physical one of overlapping of cortical processes of excitation and inhibition, or whether the conflict is based on a more highly organized psychobiological level, such as is indicated by "frustration." The essential element seems to be a difficult situation based upon a strong excitation.

Many other methods may be used, involving in general either a natural emotional shock (intense fear, fights, etc.), a difficult change in routine, or conflicting stimuli leading to opposite reactions.

ACUTE CONFLICT

The behavior of any dog can be upset temporarily by such a conflict as described above. This is expressed in his general behavior (restlessness, etc.), by a loss of equilibrium between all the CRs (changing the relative intensities, e.g., over-reacting to some, under-reacting to others), and finally, as we have been able to show recently by records of the heart rate and respiration, in emotional changes.

ACUTE BREAKDOWN

An incipient nervous imbalance may be detected by measuring the departure from normal in certain autonomic responses—in the secretion, the cardiac frequency, the character and rate of respiration, the sexual reflexes under constant stimulation. In order to detect an abnormality one must first establish the normal laws governing each one of these functions. This I have done for the secretion and the heart rate. Regarding the salivary secretion I have determined that the relation of the conditioned salivary secretion to the strength of unconditioned stimulus (amount of food) is an exponential function; the conditioned reflex can now be expressed by a formula, viz.,

$$CR = a + b (1 - e^{-cQ}),^3$$

where a , b , c are constants for a given dog, e the base of natural logarithms, and Q the quantity of food (Chart I). If there is a

³ Gantt, W. Horsley: The nervous secretion of saliva: the relation of the conditioned reflex to the intensity of the unconditioned stimulus. Am. J. Physiol., vol. 123, no. 1, p. 74, July, 1938.

departure from this formula in the salivary secretion, we have an indication of a nervous disturbance. In the following dog (Kompa) the effect of introducing a new and undifferentiated stimulus is seen on the

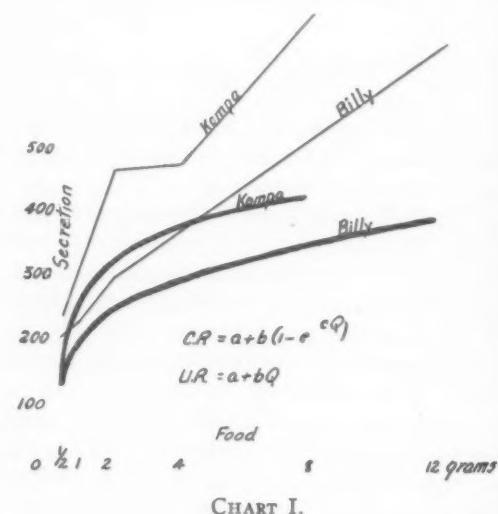


CHART I.

Temporary effect of difficult differentiation on salivary CRs.

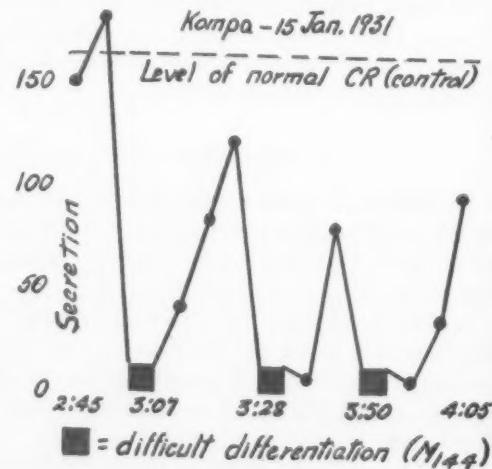


CHART II.

other conditioned reflexes. They fall to zero soon after the new (confusing) stimulus (M_{144}) is given; they gradually return to normal size during a period of 10 minutes or more (see Chart II).

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laryngeal, a nervous dog, a new on the

liver,⁴ bears a quantitative relationship to the intensity of the conditioned stimulus and to inhibition: it is larger for a signal denoting a large amount of food than it is for a signal which has habitually accompanied a small amount of food, and there is still another rate for an inhibitory stimulus. This has been established for both painful and food stimuli (Chart III). With a difficult differentiation, a situation which the animal cannot solve nor escape from, these normal relations of the cardiac reflexes become exaggerated or chaotic as can be seen in the following dog. A comparison of the heart rates in this dog in December when he was able to differentiate and in January when a new stimulus was introduced which he could

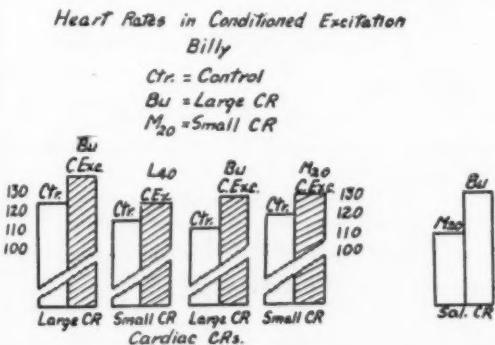


CHART III.

not differentiate shows the accompanying change in the heart rates.

The next charts illustrate the respiratory changes accompanying good differentiation, as compared with the irregularity and upheaval in the respiration in the same dog before differentiation is accomplished (Charts IV and V).

Similarly a single introduction of a new stimulus, e.g., a flashing light for 10 seconds, may cause in susceptible dogs a profound effect on the sexual reflexes measured soon after the use of this disturbing light. The following chart shows how the sexual reflexes have been reduced to zero by such a stimulus (see Chart VI).

In certain animals such a temporary im-

⁴ Gantt and Hoffman: Conditioned cardiorespiratory changes accompanying conditioned food reflexes. Am. J. Physiol., vol. 129, no. 2, pp. 360-61, May, 1940.

balance may become chronic. The two chief factors seem to be (1) the constitution of the individual, and (2) the severity of the conflict.

CONSTITUTION

Whether an animal will show a permanent disturbance under strain, as well as the extent of the disturbance in behavior and in the

Jan. 3, 1941

Showing regular respiration in labile dog after formation C.R. - avoiding shock
Dog "D"

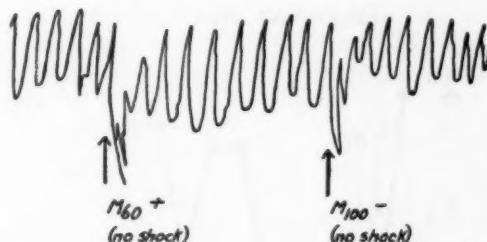


CHART IV.

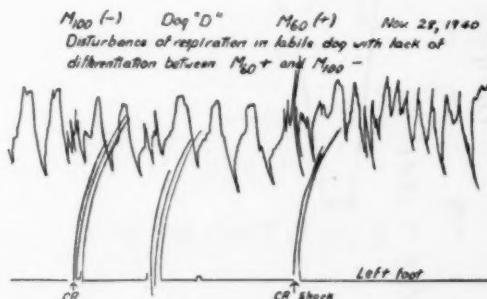


CHART V.

autonomic system depends upon the stability of the animal. Three animals were subjected to identical situations of conflict—the differentiation of two tones of 1012 and 1024. All three showed temporary disturbances. One of these developed a chronic and apparently incurable neurosis, while the other two could be promptly cured by appropriate means.

DEVELOPMENT

The pathological animal showed not only an acute disturbance, but a series of developments which have continued for a period of

nine years since the original conflict. The animal was subjected to the difficult differentiation for several months in 1932; bringing him into the experimental environment since then has apparently been sufficient to induce the spread of the neurosis to new physiological systems ("Nick").

GENERAL BEHAVIOR

The food excitation passed over into one of defense, characterized by resistance to

*Effect of inhibitory stimulus (L40)
in labile dog (Peik) on sexual Reflexes
(duration erection)*



CHART VI.

being brought into the environment and panicky fear reactions of a severe degree.

The animal exhibits all the symptoms to a former signal for food that an ordinary dog does for actual pain, viz., whimpering, howling, retreating, rapid panting, tachycardia.

Any new element brought into the old environment and closely associated with it acquires the function of producing the nervous state. Thus not only the conditioned signals originally used in the environment, but any new one introduced even after several years during which there has been no actual con-

flict, may acquire the property of bringing on all the symptoms. For example, a flashing light, which had never been used before and which was without effect the first time employed, after 8-10 combinations of light with tone, evoked almost the identical responses as the tone itself (Chart VII).

GASTROINTESTINAL SYSTEM

The environment and particularly the specific stimuli used exert an inhibitory influence on all the conditioned food reflexes. The secretion of saliva to food is inhibited. It is safe to assume that also the gastric secretion and the pancreatic, which is initiated by the gastric secretion, as well as the concomitant expulsion of bile, suffer in the same

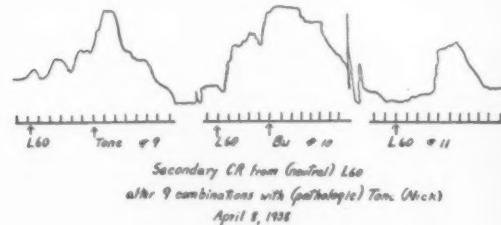


CHART VII.

way. It is important to note, however, that the secretions which are not dependent upon the cerebral cortex are not inhibited, such as the unconditioned reflex and chemical secretions.

RESPIRATION

Two years after the original conflict the animal began to show (1) a respiratory tic when he was brought into the environment or even approached it (this consisted in loud, raucous, and prolonged expirations and inspirations); (2) marked changes in respiration followed any of the signals used in the original environment, or (3) even those which were later associated with it, as shown in Chart VII.

HEART RATES

In the experimental environment the heart rate is constantly elevated, ranging between 130 to 205, with exacerbations when any of the original signals are used (Chart VIII). When this dog was removed from the ex-

perimental laboratory to a farm life his heart rate dropped about 50 per cent (95 to 130). A normal dog shows a slightly increased heart rate during the CR for food—from about 110 to 125.

MICTURITION

Intractable pollakiuria is present in the experimental environment, beginning about two years after the conflict, sometimes as much as thirty times in an hour. It is extremely rare that a normal dog urinates in the experimental room or on the stand, even though he may be kept there for 7 hours or more. However, one of the most neurotic of our dogs begins urinating frequently anywhere and everywhere in the environment of

signal. On the other hand, a condition of ejaculatio præcox is seen in the environment of conflict during adequate sexual stimulation. In normal dogs the working environment has no effect upon the onset and duration of erection to normal stimuli, while in this animal the onset and duration were decreased by the environment to about one-third of what they were outside the environment.

SOCIAL RELATIONSHIPS

The presence of the observer also has a temporary dissipating effect upon the anxiety-like state. The dyspnea disappears, the animal is quiet, and the fear reaction may be completely abated, or delayed until the human companion leaves the room. The close proximity and especially petting by almost

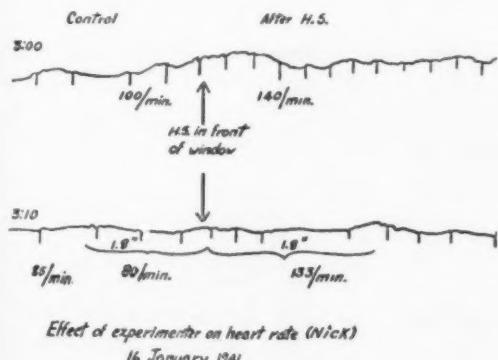


CHART VIII.

conflict, and even aggressively, on the same type of food which was used 5 years previously to produce the conflict. One might easily draw a parallel here to the enuresis of nervous children.

SEXUAL REFLEXES

Reciprocal relations have been noted in several neurotic dogs between the sexual excitation and the anxiety state described above. Normal sexual relations had a temporary dissipating effect upon the neurosis. Secondly in the experimental environment neurotic dogs show, on the one hand, frequent and almost constant erections reactive to the environment and particularly the specific signals formerly connected with food and the difficult problem, sexual erections appearing within a few seconds after a conditioned

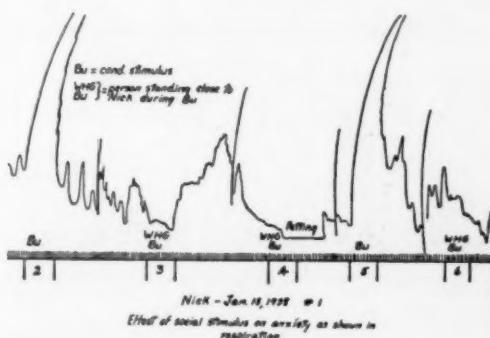


CHART IX.

any human subject has this beneficial effect whereas the presence of another dog, except for special "friends," does not have this specific effect (Chart IX).

ACTIVITY

The 24-hour activity of the animals which have become neurotic does not differ in amount from the normal—it may be either exaggerated or diminished, depending upon the type of dog. However we have shown that an interesting correlation in activity exists between normal dogs that is not present between the neurotic and the normal dogs.⁵ Thus the normal dogs show parallel

⁵ Gant and Muncie: Rhythmic variations of gross muscular activity in dogs correlated with secretion and with conditioned reflexes. Proc. Am. Physiol. Soc., Apr., 1941, p. 99.

fluctuations in their activity when placed in adjacent cages, but the activity of the neurotic dog is independent of those surrounding him, to the extent that there is no positive correlation.

mental room in that period. After two months in the country in 1937 the dog showed a marked improvement—diminished heart rate, quieter respiration, less whining and defense reactions, less pollakiuria. This

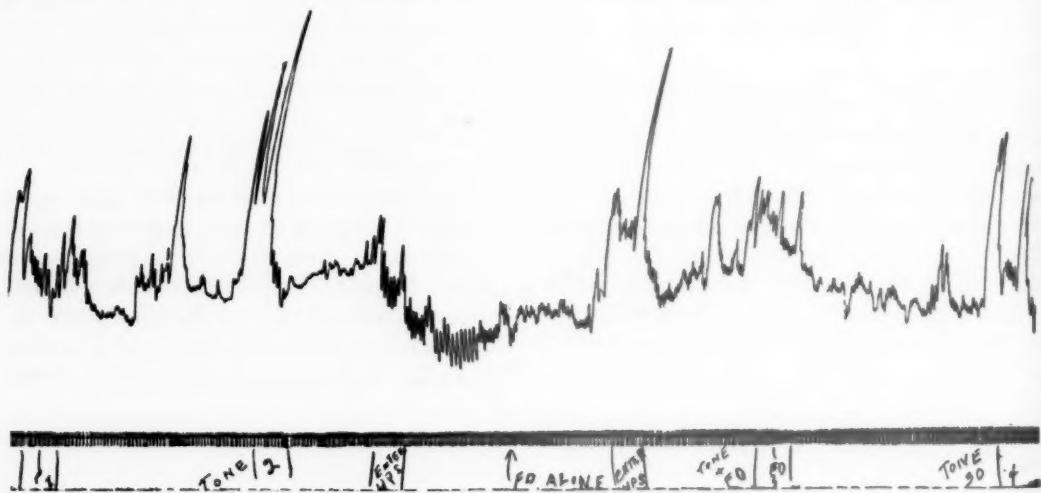


CHART X.—Changes in respiration on May 25, 1937 to pathological stimulus, tone. (Dog Nick.)

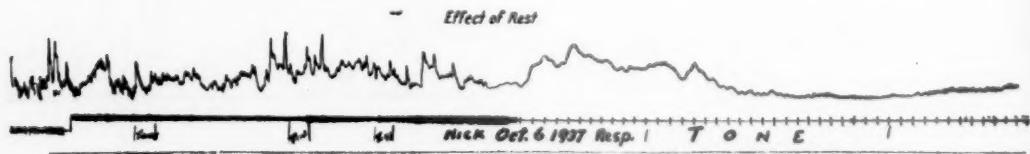


CHART XI.—Showing effect of rest in country on respiratory reaction to pathological tone one day after return of Nick to laboratory.

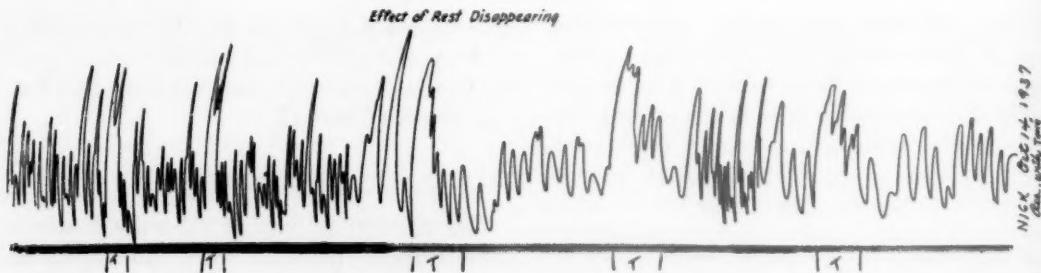


CHART XII.—Showing reappearance of pathological respiratory reaction to tone on Oct. 14, 1937, two weeks after return of Nick to laboratory.

THERAPY

A pronounced improvement was obtained by removal of the dog to an entirely new environment—to a farm. The improvement could not be obtained by 18 months' rest in the laboratory environment, even though the dog was not brought down into the experi-

condition lasted for several weeks after the dog was returned to the laboratory environment, but in that environment the symptoms gradually reappeared. The following 3 charts show: the respiration before rest in the country (Chart X), one day after his return to the laboratory (Chart XI) and two

weeks and six months later (Charts XII, VII).

A longer rest in the country, 18 months (1939-40) had a greater effect in reducing the abnormal symptoms. While on the farm he gradually became almost normal except for a few relapses. After returning to the laboratory in January 1941 this neurotic dog (Nick) has shown a great improvement,

none outside; this had an ameliorating result only during the period that the dog was being fed there.

CONCLUSION

The most striking features in this study have been the importance of the individual and the extension of the effects of the conflict for years after its original use as well as the extension to new systems later during the life of the dog.

The most important therapeutic indication is the detection of susceptible animals by measuring the reactions under strain, and preventing the progress of the strain to that point at which a permanent breakdown occurs. Once the disturbance is thoroughly established, therapy is difficult. Improvement has been seen with a complete change of environment—removal to farm life for 18 months. Rest in the environment of conflict was unavailing.

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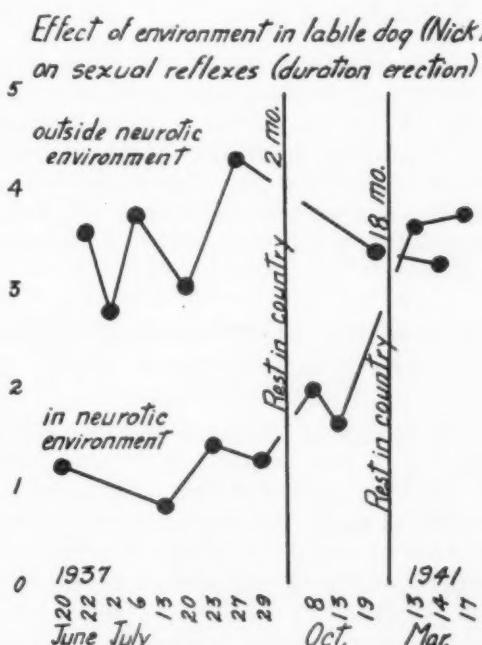


CHART XIII.

though almost all of his old symptoms reappeared in the experimental room, but in a lesser degree. Chart XIII illustrates the effect of rest on the sexual reflexes.

Other attempts to modify the environment had only a temporary effect. One of the measures used was transformation of the environment from unpleasant to pleasant by giving him all of his daily rations for several months in the experimental environment and

RANGE OF PSYCHIATRIC MATERIAL WITHIN THE STATE SCHOOL¹

EDWARD J. HUMPHREYS, M.D.

Director of Research, Letchworth Village, Thiells, Rockland Co., N.Y.

AND

SUZANNE HOWE, M.D.

Letchworth Village, Thiells, Rockland Co., N.Y.

Psychiatric responsibility for the treatment of the mentally ill in state hospitals has become an accepted fact, but organized psychiatric treatment of personality and behavioral disorders of mental defectives within state schools has hardly been initiated (10). This lack of organized psychiatric treatment of state school patients is due to a number of factors. In the first place, the social significance of the subnormal has not been clearly visualized by many professional workers in the medical and social sciences or by the community-at-large. Then, the rôle that the institution might play in socialization therapy of the subnormal has been interpreted, in many instances, only in the terms of custodianship. Undue emphasis has been placed upon the "hopelessness" of doing anything for a defective. "Once a defective—always a defective" is a specific expression of this emphasis. The failure to recognize the extraordinary range in psychiatric material within the state school and the associated opportunities to develop new fields of psychiatric practice and research has been especially glaring.

It is the purpose of this paper to make a simple presentation of psychiatric case-material selected to illustrate briefly the range of material found within a state school, and to show the need for organized psychiatric treatment-procedures. The case-material on 32 patients has been summarized from 150 case-records of mental defectives and is divided into five major groupings: personality and character disorders associated with genetic and metabolic factors; disorders following infection and trauma; disorders manifested in psychotic and in psychoneurotic

reactions; disorders known as "psychopathic states"; and, behavior disorders of childhood. A number of the individuals have been studied in detail and followed over a period of several years. This report is preliminary to a more extensive analysis of the range of psychiatric disorders in mental defectives.

A. PERSONALITY AND CHARACTER DISORDERS ASSOCIATED WITH GENETIC AND METABOLIC FACTORS

This group of disorders includes three subgroups: first, individuals in whom the disorders are associated with multiple-factor heredity as expressed especially in the familial types of deficiency; second, disorders associated with gene-recessive or gene-dominant biochemical deficiencies; third, disorders whose relation to heredity and to metabolism may or may not be clearly known.

I. FAMILIAL TYPES OF DEFICIENCY

CASE 1.—*C-B-Y-S-H Families* (closely related). Notorious for poor living standards, for immorality, alcoholism, close intermarriage, high percentage within institutions. For generations, town, county and state charges. Incomplete compilation of data show 30 sexually promiscuous, 32 definitely defective, 17 had criminal records, 8 were illegitimate, 6 alcoholic, 6 tubercular, 4 were definitely insane, 2 drug addicts, one flagrant case of incest.

CASE 2.—*B. Family*—known as "pink-eyed B." because of a hereditary eye condition. Town, county and state charges for many years. Incest, intermarriage, alcoholism, immorality and degeneracy are prevalent in history; sexually promiscuous—24; definitely defective—20; doubtful mental age—22; 26 in state institutions.

Comments

The psychiatric disorders in the familial types of deficiencies are immensely varied.

¹ Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

The biological patterns of these disorders are definitely dysgenic and the cultural configurations are specifically primitive, infantile, psychopathological and delinquent in nature. The psychiatrist may ask—"Is the treatment approach to such disorders through the group or through the individual?" He will quickly realize that both the group and the individual must receive psychiatric attention, within the community and within the state institution. How best can the psychiatrist handle the problems of group immorality, of alcoholism, of drug addiction, of insanity, of criminality—in mentally subnormal human beings? Only through a broad interpretation of medical and eugenical measures for the social control of the families and for the socialization of the individual can there be an attempt to eliminate some of the manifold psychiatric syndromes found among the familial types of defectives(9). This will require his working with various community agencies as well as with those operating under state auspices (21).

II. INHERITED BIOCHEMICAL DEFICIENCIES

CASE 3.—M. M. (and related cases). *Phenylpyruvic oligophrenia* (gene recessive). C. A. 18, M. A. 18 months, I. Q. — 10. Usually sits in corner, rocks back and forth, expresses anxiety, calls "Baby Pat" (her idiot child). Hardly any vocabulary. Has to be constantly cared for. Jervis(13) has found that in general, the patients were apathetic, at times semistuporous, slow in motor activities and easily managed. In a few patients, echolalia, echopraxia, stereotyped bizarre movements, emotional unbalance as in expressive movements of fear and anxiety, were observed.

Comments

See next section.

III. OTHER TYPES OF DEFICIENCIES IN WHICH GENETIC AND METABOLIC FACTORS ARE OPERATIVE—WHICH MAY OR MAY NOT BE WELL UNDERSTOOD

CASE 4.—H. D. *Tubero-sclerosis*. C. A. 6-8, M. A. 9.9 months, I. Q. 12. Has always been restless and hyperactive. Unclean in habits. Must be fed and dressed. Screams, grinds teeth, hits head and cries for hours at a time.

CASE 5.—R. C. *Mongolism*. C. A. 4-0, M. A. 9.6 months I. Q. 20. Mental age less than year. Lies

almost constantly on back. Rocks sidewise and occasionally slaps body up and down on bed. Frequently pushes fingers and thumbs behind eyeballs causing the eyeballs to extend. No language. (Ten such non-mongolian cases of ocular manipulation have been studied. Although such activities may be similar to the putting of the fingers into body orifices, these cases of ocular manipulation in low grades are interesting to compare with the cases of self-mutilation described by Goodhart and Savitsky(7) and by Conn(3).)

CASE 6.—N. A. *Claw Hands*. C. A. 12-4, M. A. 8-6, I. Q. 69. High grade defective. Good work in school and shop. Pleasant personality, cooperative, but very sensitive about deformity. Needs reassurance from physician.

Comments on II and III

While the patients representing the genetic and metabolic types constitute a most extensive array of disorders, the psychiatrist faces an essentially different task with these patients as compared with that of the familial types of deficiency. His attention is directed primarily to the individual. What therapeutic measures may be taken are determined by the general level of personality integration of the patient. The psychiatrist can definitely assist the higher grade patients in these groups to make more satisfactory adjustment, as for example, in the case of the high grade patient with the claw hands. Work with the lower grade patients is primarily that of nursing care, as represented by the cases of tubero-sclerosis and mongolism. The psychiatrist finds in the study of these patients, unusual opportunities for the cross and longitudinal study of human behavior so frequently masked by symbolic mechanisms in the individual of higher organic and cultural organization. Earl(6), Hayman(8), Pearson(17), and others have described graded series of behavioral reactions correlating with various degrees of psychological organization.

B. PERSONALITY AND CHARACTER DISORDERS ASSOCIATED WITH FACTORS OF TRAUMA AND INFECTION

Turning to behavior disturbances following injury through trauma and infection, several cases represent only a few of the many variations that may be found.

I. TRAUMA

(a) NATAL

CASE 7.—J. M. C. A. 22-4, M. A. 11-6, I. Q. 72. Spastic. Unruly, difficult to control. Untruthful, childish, temper tantrums. Careless and heedless in traffic. Began to remain away from home for increasing periods. Hearty eater and talker.

(b) POST-NATAL

CASE 8.—R. D. A. C. A. 4-11, M. A. 4-0, I. Q. 81. Two severe falls resulting in optic atrophy. Spastic. Easily scared and shakes "all over." Behavior in group aggressive and anti-social. Becomes absorbed in what he is doing, and blocks. Whines, has high-pitched laugh. Usually restless. Out of mother's control. Unpleasant home relationship between mother and step-father. Patient seemed terrorized by mother. When on street, would run and touch everything he could, and would take toys from others. Became noisy, destructive and out of control.

II. INFECTION

CASE 9.—C. P. *Congenital syphilis*. C. A. 16, M. A. —3, I. Q. —20. Low grade intelligence. Sits and rocks much of day. Can attend to body needs but constantly requires supervision. Eats ravenously. Presses finger into left eye which may become partially extended. Limited echolalia.

CASE 10.—W. S. *Juvenile paresis*. C. A. 9-3, M. A. 9-1, I. Q. 98. High grade school boy. Easy flow of language. Developed neurological changes. Became depressed, then elated, showed impaired judgment, at times became incoherent and deteriorated. Had to be transferred to state hospital.

CASE 11.—E. C. *Measles*. C. A. 4-3, M. A. 22-8 months, I. Q. 45. Marked physical and mental changes after measles at $2\frac{1}{2}$ years. Crying and laughing spells, destructive, often turned on gas, truant, gluttonous or starved self, bangs head, fights other children.

Comments

The psychiatrist can distinguish no post-traumatic or post-infectious behavioral syndrome in these or other cases of mental deficiency that is strictly pathognomonic of a given organic process. Epidemic encephalitis may be followed by certain types of behavior which may occur in different cases but otherwise, the greatest variation in behavioral responses may be seen. This variation is due to the degrees of injury produced by causative agents and to the location of the injury—whether diffuse or localized in nature. One might expect that organic lesions would produce syndromes different from those ob-

served in fundamental psychoses but Schilader (19), from one point of view, claimed that such an expectation is not borne out by clinical studies. Levin (16), from another point of view, has emphasized the high frequency of restlessness in children with cerebral lesions. He also compares "the syndrome of restlessness, morbid hunger and mental deficiency" with "the syndrome of the prefrontal region" experimentally produced in primates and other animals. In treating these types of disorders, the psychiatrist must deal primarily with the individual and his special needs and capacity for therapeutic efforts.

C. PERSONALITY AND CHARACTER DISORDERS MANIFESTED IN PSYCHOTIC AND PSYCHONEUROTIC REACTIONS

The next group of disorders are more easily recognized as psychotic and psycho-neurotic reactions in which the organic factors are frequently not clearly discerned.

I. PSYCHOTIC REACTIONS

CASE 12. E. D. *Catatonia*. C. A. 8-6, M. A. 4-4, I. Q. 51. Father and mother mentally defective, and paternal grandparents considered defective. Was placed in first grade. Did well for awhile, then lost interest. Time of onset not determined—apparently at an early age and definitely pre-pubertal. Developed catatonia and has remained in such state for eight years.

CASE 13.—L. H. *Catatonia and hebephrenia* (and trace of paranoia ?). C. A. 17-11, M. A. 6-0, I. Q. 38. Late in teething, sat alone at 13 months, began to walk at 2 years. Began to talk at 3 years. School at 5 years but was unable to learn simplest things; lacked concentration. Remained in ungraded class until 16 years old. Preferred to stay by himself, shunned companionship except occasionally that of younger boys. Became gluttonous, occasionally was quarrelsome but usually friendly. Developed silly smiling, marked slowing of speech and motor activity, made no decisions, deteriorating. Once thought he heard a voice.

CASE 14.—M. R. *Hebephrenia*. C. A. 8-1, M. A. 3-6, I. Q. 43. Originally attended school, having average intelligence. At eight began picking things out of air, turned lights on and off, became incoherent. Improved, then was hospitalized. Sang popular songs, made up names for people, became silly, masturbated frequently and openly, made bizarre movements. Finally considered juvenile schizophrenic, hebephrenic type. Later committed to state school.

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CASE 15.—F. N. *Paranoia*. C. A. 19-5, M. A. 9-9, I. Q. 61. Father alcoholic, mother paranoid psychopath, paternal aunt once in state hospital, sister hebephrenic, brother and sister in Letchworth Village. Paroled after 6 years. Did satisfactory work. On parole, suddenly developed acute hallucinations and delusions of grandeur. Trends were suicidal and homicidal. Committed to state hospital.

CASE 16.—I. S. *Manic-depressive*. C. A. 10-3, M. A. 5-8, I. Q. 55. Double otitis at 2½ and 4 years. From 3 years on—sadistic, destructive, over-active, temper tantrums, poor mixer, distractible. In institution exhibited extreme psychomotor activity. Transferred to state hospital. Diagnosed a manic.

CASE 17.—I. S. *Excitement-reactions*. C. A. 16-11, M. A. 10-6, I. Q. 66. 7 A at 15 years. Attractive high grade female defective. Entire life has been filled with episodic outbursts of excitement, temper tantrums, hyperactivity, destructiveness, loud screaming, actual assault, and occasional drinking. Transferred to a state hospital. She has been frequently paroled, is well liked until excitement reactions occur, and has to be returned from parole repeatedly. Consistent patterns of unpredictable excitement-reactions which may become indistinguishable from psychotic excitement.

CASE 18.—M. O. *Reactive-Depression*. C. A. 17-3, M. A. 7-0, I. Q. 44. Father unstable. Mother appeared subnormal. A deaf mute. Developed periods of intense crying and depression which were alleviated after being removed from a mildly competitive class system to a dormitory where she could help care for infirm children.

Comments

The study of psychotic reactions in mental defectives raises many questions of fundamental importance to the psychiatrist. He may ask: "When did this psychosis actually begin? Did it arise within an organism already defective? Is the psychosis a manifestation of either specific or of relative defect of the total organism? Can a psychosis represent a form of mental deficiency? When may psychophysiological responses be considered abnormal? Must a certain degree of cultural attainment be reached before psychotic responses can occur?" Clinically, one might ask, may the cases of catatonia and paranoia cited above be considered as manifestations of defect in the family group? Kallmann (14) and Kallmann, Barrera, Hoch and Kelley (15) have shown that "the endogenous forms of schizophrenia and mental deficiency are based on different genetic factors which are specific and not related to each other." In the case of hebephrenia, the pa-

tient was originally not defective but through regression and deterioration, became socially a low grade imbecile. This case which illustrates the importance of the history in differential diagnoses between mental defect and mental illness was in the original group of juvenile schizophrenics studied by Potter (18). Bradley (2) has recently made reference to mental deficiency in relation to schizophrenia in his important book on "Schizophrenia in Childhood." In the excitement-reactions, the psychotic states may be manifestations of mental defect. Duncan, Penrose and Turnbull (5) and Duncan (4) have suggested that certain manic reactions may be manifestations of mental defect, although this view has been opposed by Slater (20). Case 17, excitement-reaction, is an example of an important problem faced by the institution. Not infrequently, unstable girls will give a history of unpredictable outbursts or outbursts regularly associated with menses. Some of these patients are destined for state hospital care.

These cases obviously need psychiatric care either within a state hospital or within the state school itself. If all of the state school patients who might be technically diagnosed as psychotic were removed to state hospitals, it would not be long before a new group would appear—either freshly received from the community—or as a result of breakdowns of patients already committed to the school. A high frequency of episodic psychotic or psychotic-like outbursts is encountered clinically among the defective. With the development of more formally organized psychiatric services within the state school, the institution could greatly increase its usefulness to the patient, to the state department of mental hygiene, and to the community.

II. PSYCHONEUROTIC REACTIONS

CASE 19.—L. C. *Eye tic*. C. A. 8-1, M. A. 5-3, I. Q. 65. High grade school boy. Pleasant type, under tension. Would not look people in the eye while talking. Would look to side. Flattered eyelids frequently. After period of several months' contact with physician and cottage group, tic largely disappeared.

CASE 20.—J. S. *Hypermotility and passing of gas*. C. A. 11-2, M. A. 7-0, I. Q. 63. Middle grade defective. History of manic excitement. Defensive, braggadocio, hypermotile. For several weeks during

interviews would expel gas per rectum every few minutes, would say "excuse me" and continue to repeat action.

CASE 21.—A. B. *Psychasthenia*. C. A. 18, M. A. 11, I. Q. 70. A high grade school boy who frequently complained of stomach pains, of fatigue and inability to work. No organic pathology was found. Symptoms disappeared with alteration of certain environmental pressures.

CASE 22.—F. H. *Anxiety and hysteria*. C. A. 32, M. A. 7-7, I. Q. 48. Brain fever at 2 years. 5th grade at 6 years. Two illegitimate children by different men. Factory worker. Occasionally when under stress, develops anxiety, then general anesthesia over body, followed by loss of conjunctival and palatal reflexes, all reflexes become diminished, and patient appears to be in a trance and remains so for a few hours to over a day. States she is aware of people while in trance but feels they are far away.

Comments on C

Psychoneurotic reactions in the institutionalized mentally defective do occur but usually not as fully developed syndromes. These reactions may be found as part-reactions associated with disorders of childhood. The second patient had a hypomanic personality with a history of manic-excitement. The fourth patient had a definite history of organic illness. The important point to emphasize is the lack of our knowledge concerning the nature and extent of psychoneurotic reactions among the mentally defective.

In the official U. S. government report on neuropsychiatric work in the armed forces during the first World War (1), it was stated, "The question of the occurrences of psychoneurosis with mental deficiency is one of importance. It was remarked in our hospitals as well as in those of other countries, that many of the functional nervous cases presented inferior intelligence. This seemed to be particularly the case in hysteria, especially in the variations presenting paralysis and other somatic symptoms." More clinical and scientific study of psychoneuroses in the mentally defective is clearly indicated. Psychotherapy calls for individual attention and for a flexible institutional and community program.

D. PERSONALITY AND CHARACTER CHANGES EXPRESSED IN PSYCHOPATHIC STATES

(All patients have been transferred to a state institution for defective delinquents,

excepting one who was confined to a state hospital.)

Among the most important of the psychiatric disorders, whether found associated with the mentally defective or with other individuals not intellectually defective, are those of "the psychopathic states." Within this group the distinction between mental defect and mental illness may become unclear (11).

CASE 23.—J. W. C. A. 13-10, M. A. 8-10, I. Q. 64, 4th grade. Negro orphan, sneaky, impudent, disobedient, sulky, stabbed boy in back with knife, injured skull of another boy. Unresponsive to sympathy or punishment.

CASE 24.—B. M. C. A. 11-10, M. A. 6-11, I. Q. 58, 12 years ungraded class. Poor family background. Congenital syphilis. Truant, restless, irresponsible, inadequate, got mixed up with gang. Arrested for stealing but likely a hanger-on, not considered vicious.

CASE 25.—E. K. C. A. 18-6, M. A. 9-1, I. Q. 57. Female epileptic. Ungraded class after 4th grade. Extremely bad home situation. Infantile in judgment and emotional reactions. Seriously assaulted attendant. Insolent, disobedient. Constant disturber of cottage life.

CASE 26.—C. R. C. A. 13-9, M. A. 7-2, I. Q. 59, 7 years to school. Bad home conditions. Arrested several times for attempted burglary and for grand larceny. Long series of offenses in institutions.

CASE 27.—I. J. C. A. 14-11, M. A. 6-10, I. Q. 46. Sudden outbursts of temper. Incorrigibility in pre-institutional and in institutional life. During anger, suddenly hit patient on head with block of wood, from which patient died. Subsequently saw blood in sky, on floor, on hands.

Comments on D

A long list of patients exhibiting different psychopathic states could be given. Most of these patients belong to the high grade, borderline and dull normal groups, a lesser number to the middle grade groups. The psychopaths represent the most difficult problems being faced by the state school which has not been organized to care for these delinquent types. The most varied social offenses are committed by psychopaths, but the psychopathic defective usually commits antisocial acts not requiring ingenuity. Increasing numbers are being sent to the state school. Many are too delinquent and too intelligent for the state school, not sufficiently intelligent for the state training school for delin-

quents, and not sufficiently delinquent for commitment to the state institutions for defective delinquents (12). These patients are more defective from the viewpoint of emotional or of social organization than of defect in intelligence as determined by ordinary test procedures. Many such patients could be more adequately cared for by placement within a separate unit of the state school or within an institution organized to meet the special needs of these patients. Despite the severity of some of the delinquency reactions of defectives, the government report on neuropsychiatric work in the armed forces during the first World War (1) included the statement that "Mental defectives are in general the petty offenders and the individuals who commit chiefly misdemeanors." It was also stated that "Of the disciplinary cases reported by neuropsychiatrists, 42.3 per cent were mental defectives." Psychiatric treatment of these patients should include the institutional care of the chronically delinquent and personal attention to the individual himself. Attention to the ego appeals strongly to most human beings but this is especially true of the psychopath. Psychiatric emphasis upon the fact that his (the psychopath's) behavior brings trouble to him rather than trouble to others, will at times work well therapeutically with certain psychopaths. It is surprising that some patients of this type eventually make good in the community.

E. BEHAVIOR DISORDERS OF CHILDHOOD

It is a striking fact that the mentally defective children possessing a capacity for a certain amount of school work exhibit practically as varied a range in the behavior disorders of childhood as do other children not intellectually defective.

CASE 28.—G. B. C. A. 11-2, M. A. 7-8, I. Q. 69. Moron, wandered away from home, childish and immature. Outlook poor.

CASE 29.—J. C. C. A. 13-3, M. A. 10-0, I. Q. 84. Female, borderline. Promiscuous parents. Speech defect. Unable to take responsibilities in house. Inadequate supervision. Difficult to handle.

CASE 30.—R. C. C. A. 15-2, M. A. 10-6, I. Q. 69. Female. Borderline. Unfortunate family history. Has been forced to be on defensive a good deal. History of stealing (attention factor). Adjusting satisfactorily in school.

CASE 31.—R. D. C. A. 4-11, M. A. 4-0, I. Q. 81. Not considered intellectually defective. Very overactive and restless. Bites and scratches children. A "terror" in cottage.

CASE 32.—J. M. C. A. 9-3, M. A. 6-10, I. Q. 74. Borderline. Inadequate provisions for him in community. He has adjusted well in institution and it was deemed that if the patient were to have a satisfactory place in the community, he would make a good adjustment there.

Comments

These few cases of behavioral disorders of children as found among the mentally defective poorly illustrate the rich variation in such disorders as found within the state school. These disorders may represent immaturities of the patient himself, or expressions of rebellion against, or flight from, a difficult environment. The inadequacy of the individual may be a reflection of the inadequacy of the environment rather than a basic defect of the individual. A comprehensive institutional program may help the individual to adjust, or personal attention to the individual may be needed, or, a combination of both therapeutic approaches may be indicated. Psychotherapy with this group should be closely related to the return of the patient to the community. Psychotherapy within the community should prevent a number of these individuals from entering the state school (12).

SUMMARY

The cases so briefly cited above represent only a few of the endless variations in personality and character found within the state school. It may be said that clinical study of the mentally defective in state schools reveals one series of psychiatric disorders and the study of patients within the state hospital another series. These series of psychiatric disorders frequently overlap. The psychiatrist in the state school is faced with the necessity of developing large scale or selective group therapy as well as individual therapy for individuals with subnormal intelligence (10). The psychiatrist must deal not only with defects in intelligence but also with defects in conation, feeling, emotion, temperament and character (11). With the familial types, psychiatric therapy has to be directed distinctly along social and eugenic

lines in reference to the individual and to the group. With disorders due to specific genetic, metabolic, traumatic or infectious factors, psychiatric therapy must be related more directly toward the individual. Psychiatric therapy for the psychotic defective is often times a matter of hospital attention. Psychotherapy for the psychoneurotic defective, or for the psychopathic defective, may be a matter of institutionalization or of intensive individual attention. Psychotherapy for the behavior disorders of childhood as found in defectives should include formally organized psychiatric or mental hygiene services within both the institution and the community. The large numbers of subnormal individuals within the community-at-large, considered especially in relation to the present-day social pressures, call for increased attention to the psychiatric needs of the subnormal groups—whether within the institution or within the community.

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EFFECT OF THYROID MEDICATION ON BRAIN METABOLISM OF CRETINS¹

By H. E. HIMWICH, M.D., C. DALY, M.D., J. F. FAZEKAS

AND

H. C. HERRLICH

The effect of thyroid to augment metabolism of the intact organism is well known. This augmentation may be imputed in part to an acceleration of the intrinsic cellular oxidations and partly to mechanisms involving the organization of the entire animal. An example of the latter is the heightened function of the sympathetic nervous system during hyperthyroidism. Results obtained *in vitro* reveal an increased intrinsic metabolism of most excised tissues of animals subjected to thyroid feeding (1). Unfortunately, the evidence on the brain is contradictory for both an increase (2, 3) and no change (4, 5) are reported. The effects of thyroid medication on excised cerebral tissues of hypothyroid animals has not been determined, though it might be easier to demonstrate an increase in such conditions.

The present investigation is concerned with the effects of thyroid therapy on the brain metabolism of cretins. By studying the metabolic rate of the brain *in situ* both effects of the thyroid are taken into consideration, (1) intrinsic cellular oxidation and (2) integrative action of the organism.

METHOD

Eleven cretins² ranging in age from 9 to 31 years of age were studied. After these patients had been without thyroid medication for two months, repeated determinations of their basal metabolism were made according

to standard technique, using a Sanborn apparatus which had been in regular use at the hospital at Letchworth Village. Besides the usual tests for leaks, the machine was further checked against subjects with normal basal metabolic rates. All subjects in the post-absorptive state were brought to the laboratory where determinations of oxygen consumption, blood pressure and pulse were made under basal conditions. Readings were rejected unless the patient was entirely cooperative. Determinations were not included if the basal metabolic rate was suspiciously high or the respiratory tracings became irregular. Three to 6 satisfactory determinations were obtained on each cretin both before and after thyroid therapy. The basal metabolic rate was calculated in 3 different ways, using surface area, weight and height each as a basis of comparison. Normal standards were obtained from the tables of DuBois-Boothby (6) and Talbot (7).

In order to estimate cerebral metabolism it is necessary to determine not only the cerebral arterio-venous oxygen difference but also the rate of cerebral blood flow. Methods for the collection of the blood samples from the internal jugular vein and an artery have been previously described (8). The blood was analyzed for oxygen by the method of Van Slyke and Neill (9). The rate of blood flow in the internal jugular vein was estimated by a modification of the Gibbs thermostromuhr (10). This instrument was found to have an error of ± 10 per cent for a single reading. For that reason repeated readings over several minutes were taken to establish a single observation for blood flow. Furthermore such observations were made with each collection of blood for the determination of the arterio-venous oxygen difference. After these control tests were obtained the thyroid medication was instituted and when a definite increase in basal metabolism developed a sec-

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From the department of physiology and pharmacology, Albany Medical College, Union University, Albany, New York and Letchworth Village, Thiells, New York.

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² This group included 3 males (R. C., M. S., and I. A.) and 8 females.

ond series of determinations of brain metabolism were made. The observations were then averaged in two groups, the first before thyroid therapy and the second after thyroid therapy to evaluate the effect of the administration of thyroid on brain metabolism.

RESULTS

In Table I are presented 29 observations on 11 cretins before replacement therapy.

TABLE I
CEREBRAL ARTERIO-VENOUS OXYGEN DIFFERENCE
VOLUMES PER CENT BEFORE AND AFTER
THYROID THERAPY

¹ Patient	² Date	³ Before	⁴ Date	⁵ After
C. B.	8/5/40	4.30	8/26/40	4.80
	8/12/40	5.71	8/27/40	4.00
	8/14/40	4.76	8/29/40	3.69
	8/16/40	6.15	.....	...
M. K.	8/5/40	7.16	8/28/40	6.08
	8/12/40	6.26	8/29/40	4.92
	8/15/40	7.22	8/30/40	5.86
	8/17/40	7.66	.....	...
G. S.	8/16/40	5.44	8/27/40	4.94
	8/19/40	6.11	8/28/40	5.38
	8/20/40	6.22	8/29/40	3.59
A. C.	8/12/40	3.63	8/24/40	4.03
	8/14/40	4.77	8/26/40	3.60
	8/16/40	5.28	8/27/40	4.89
	.....	...	8/29/40	4.43
G. A.	8/12/40	5.30	8/26/40	4.38
	8/15/40	4.03	8/28/40	4.78
	8/17/40	5.14	8/29/40	4.20
B. S.	8/12/40	4.92	8/26/40	5.63
	8/15/40	5.33	8/27/40	5.20
	8/17/40	4.71	8/28/40	5.23
R. C.	8/12/40	5.78	8/26/40	3.65
	8/15/40	5.40	8/27/40	3.99
	8/17/40	5.91	8/29/40	4.25
R. G.	8/16/40	7.12	8/28/40	5.01
	8/19/40	7.48	8/30/40	5.82
M. S.	8/15/40	5.09	8/28/40	4.77
	8/19/40	7.65	.....	...
A. A.	8/5/40	6.44	.....	...
I. A.	8/6/40	4.67	.....	...
Average		5.74		4.69

The average arterio-venous oxygen difference is 5.74 volumes per cent. The average arterio-venous oxygen difference decreased to 4.69 volumes per cent after thyroid medication in 25 observations on 9 patients. The results on 8 cretins who were studied intensively are found in Table II. Each value is the average of several observations. They include the percentage changes of oxygen up-

take (column 3) taking the premedication value as a base line, the ratios between the cerebral blood flow after therapy to the flow before treatment (column 4), the averages of the cerebral arterio-venous oxygen difference before thyroid therapy (column 5), and after (column 6), the latter values corrected for blood flow (column 7) (column 7 is obtained by multiplying the values of column 4 by those of column 6). Column 8 contains the per cent increase in cerebral metabolism as a result of thyroid therapy. This increase is obtained by dividing the values of column 5 into those of column 7. The metabolic rates calculated on the basis of surface area, height, and weight are calculated in Table III.

DISCUSSION

The arterio-venous oxygen difference of the cretins before the administration of thyroid is lower than that for normal adults, 7 volumes per cent. The slow heart rate and the low blood pressure of cretins is suggestive of a slow rate of blood flow through the brain. If such is the case the difference between the cretin and normal may even be greater than indicated by our results. It is difficult, however, to find adequate controls to compare with the cretins. The age of the patient, his height and weight, as well as the size of the brain must also be considered. It is, therefore, advisable to compare the cerebral metabolism of these cretins with that of other mental defectives of approximately the same size. For that reason 16 high grade mental defectives from 9 to 13 years of age with apparently normal thyroid function were chosen. This group discloses an average arterio-venous oxygen difference of 5.16 volumes per cent. However, the average cerebral blood flow of this group is approximately 10 per cent greater than that of the cretins. Thus, a similar arterio-venous oxygen difference with this faster blood flow indicates that a brain metabolism for this group is higher than that of the cretins. Although no normal controls were obtained it would be reasonable to assume that they too would have a cerebral metabolic rate greater than that of the cretins.

Once these values for the cretins were established thyroid was administered and

additional observations were made of arterio-venous oxygen differences as well as cerebral blood flow. In 7 of the 8 patients the arterio-venous oxygen difference decreased. The average of the entire group fell from 5.69 volumes per cent to 4.76 volumes per cent. Simultaneous measurements of cerebral

determine the absolute blood flow in these experiments because the diameter of the internal jugular vein is unknown. Nevertheless the relative changes in blood flow on the same patients before and after treatment are significant by our method. The average increase in blood flow in these ex-

TABLE II

CHANGES OF TOTAL METABOLISM, CEREBRAL BLOOD FLOW, CEREBRAL ARTERIO-VENOUS OXYGEN DIFFERENCES, AND CEREBRAL METABOLISM DURING THYROID THERAPY

Patient	Age	3 Increase oxygen uptake, per cent	4 Blood flow ratio	5 Arterio-venous oxygen difference. Volumes per cent			8 Increased cerebral metabolism, per cent
				Before	After	7 After corrected	
C. B.	22	22	1.48	5.23	4.18	6.19	18
M. K.	19	19	1.65	7.08	5.62	9.27	31
G. S.	31	8	1.40	5.91	4.84	6.78	15
A. C.	22	44	1.81	4.56	4.24	7.68	68
G. A.	29	13	1.51	4.82	4.44	6.71	39
B. S.	9	19	1.45	4.99	5.35	7.76	56
R. C.	15	23	1.71	5.70	3.96	6.77	19
R. G.	22	29	1.52	7.30	5.43	8.26	13
Average	21	22	1.57	5.69	4.76	7.43	32

TABLE III

METABOLISM OF CRETINS CALCULATED ACCORDING TO CALORIES, BODY SURFACE, WEIGHT AND HEIGHT

Name	Before thyroid treatment				After thyroid treatment			
	Total calories, 24 hr.	Body surface, per cent	Weight, per cent	Height, per cent	Total calories, 24 hr.	Body surface, per cent	Weight, per cent	Height, per cent
A. A.	903	- 16	- 22	- 13	1030	- 1	- 11	- 2
G. A.	1050	- 5	- 14	+ 8	1188	+ 8	- 3	+ 22
A. A.	785	- 27	- 33	- 17	937	- 12	- 20	- 1
C. B.	936	- 33	- 38	- 23	1140	- 18	- 24	- 7
A. C.	875	- 22	- 32	- 8	1263	+ 12	- 1	+ 24
R. C.	806	- 35	- 35	- 23	1000	- 20	- 24	- 4
A. D.	874	- 19	- 22	- 6	1124	+ 4	0	+ 21
R. G.	774	- 42	- 46	- 34	1000	- 24	- 30	- 15
M. K.	843	- 34	- 40	- 23	1007	- 21	- 28	- 8
B. S.	880	- 20	- 14	+ 1	1045	- 7	+ 3	+ 20
M. S.	890	- 34	- 32	- 25	1034	- 23	- 20	- 13
G. S.	1015	- 29	- 29	- 28	1100	- 23	- 23	- 22
Average	—	— 26	— 30	— 17	—	+ 22	— 14	— 16
								+ 2

blood flow revealed an increased rate as a result of thyroid therapy. The faster heart rate indicates the same change and it is known that the minute volume of the heart increases proportionately more than metabolism with thyroid administration (11). The smaller arterio-venous oxygen difference after therapy is similarly caused by an acceleration of blood flow greater than that of cerebral metabolism. It is impossible to de-

termine the absolute blood flow in these experiments was 57 per cent and is therefore greater than that of basal metabolism. In order to determine whether there is simultaneous change in cerebral metabolism it is necessary to take into consideration the changes of blood flow and the arterio-venous oxygen difference. It can be seen from Table II, column 8, that in every instance brain metabolism increases with an average value of 32 per cent, range 15 to 68 per cent.

This indicates that the brain is susceptible to the stimulating effect of thyroid. Though the increase in cerebral metabolism in any individual case may not necessarily agree with that of basal metabolism yet the average acceleration of the cerebral metabolism of the 8 patients is similar to that of the body as a whole.

The present study presents an opportunity to correlate brain metabolism with other cerebral functions. For that reason two other investigations were made simultaneously on our group of cretins. Dr. Kreezer and Mr. Smith investigated brain potentials with the aid of the electroencephalograph and psychological studies were made by Dr. McCulloch and Mrs. Rymarkiewiczowa.

Correlations between brain metabolism and the spontaneous electrical activity of the brain are possible because both processes are interrelated. It is significant that our patients showed an increase in the energy level of the brain waves in certain frequency ranges, 7 to 11 cycles per second. The spontaneous electrical activity of the brain cells, therefore, reveals a greater release of energy.

The cretins used as subjects in the main experiments were also given a battery of tests before and after the administration of thyroid for the purpose of determining the effect of the increased rate upon different physiological processes. A control group, equated in capacity as well as possible, was given the same initial tests and subsequently was retested after the same interval separating the testings of the experimental group. Thus, any significant change found in the experimental group was validated by its non-occurrence in the control group. Either standardized or specially devised tests were given of: steadiness, speed of tapping, speed of free association, perception (visual), learning, and immediate memory. The changes found were generally not very marked: (1) appreciable decrease in steadiness was noted, (2) any improvements of performance in tests of perception and learning were of questionable significance in the higher mental processes, and (3) speeds of tapping and of verbal production seem to be slightly increased. It may, therefore, be concluded that the greatest change was noted in processes closely related to greater energy expenditure.

Psychological activity became more rapid, but not better.

BASAL METABOLISM

Values for basal metabolic rate based on surface area and weight checked with each other fairly well in most cases. In contrast, the basal metabolic rates based on height were generally higher and quite variable. The cretins did not all exhibit similar degrees of hypothyroidism. For instance G. A.³ had an initial basal metabolic rate of -5 per cent while R. G. showed a rate of -42 per cent which is practically complete thyroid deficiency. Parke Davis desiccated thyroid was administered with an average of 3 grains per day over a period of 10 to 12 days. In the various patients the increase over the original values of oxygen uptake varied from 8 to 44 per cent with an average of +22 per cent. These differences when based on body surface or weight revealed an increase from -28 to -15 per cent. These changes in metabolism are the resultant of 2 influences, organizational of the intact organism and intracellular oxidations. It is not possible to evaluate quantitatively each of these two components. However, there is no doubt that changes of intrinsic metabolism underlie the increased metabolic rate of the entire organism as well as that of the brain, the augmented electrical cerebral responses and the accelerated psychological performance.

Recent work indicates that the administration of thyroid is associated with an increased concentration of respiratory enzymes (2). Probably all links of the respiratory enzyme chain take part in this increase, though not necessarily to the same extent. Klein (12) has presented evidence for a greater concentration of specific proteins which go to form the respiratory enzymes. With a greater concentration of enzymes and adequate supplies of carbohydrate and oxygen a higher metabolic rate must develop.

SUMMARY AND CONCLUSIONS

Brain metabolism of cretins was studied before and after the administration of desic-

³ Clinically G. A. exhibited the various characteristics of a cretin, although the basal metabolic rate fell within the normal range.

cated thyroid. Blood was collected from an artery and the internal jugular vein and analyzed for oxygen. Cerebral blood flow was estimated with the aid of a thermostromuhr inserted in the internal jugular vein. The oxygen uptake was also determined and sustained an average rise of 22 per cent after therapy, taking the premedication value as a base line. The deviations from standard values of basal metabolic rate are also presented. The average of 29 arterio-venous oxygen differences of 11 cretins was 5.74 volumes per cent before thyroid administration and that value was reduced to 4.69 volumes per cent on 25 observations on 9 patients after therapy. In 8 cretins the average acceleration of cerebral blood flow was 57 per cent. Alterations of brain metabolism were determined by taking into consideration the changes of the arterio-venous oxygen difference and blood flow. An average increase of 32 per cent in cerebral metabolism was thus revealed as a result of the administration of thyroid. This increase in cerebral metabolism affords a basis for alterations in the cerebral electrical potentials and psychological reactions of these patients. The electroencephalograms disclosed a rise of the energy level in certain frequency ranges. Psychologically, improvement was either absent or of questionable significance in any of the higher processes. The greatest change was that of an acceleration of psychological activity, an acceleration made possible by the increased energy expenditures stimulated by thyroid medication.

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ELECTROENCEPHALOGRAPHIC STUDIES IN DELINQUENT BEHAVIOR PROBLEM CHILDREN¹

By NORMAN Q. BRILL, M.D., HERTA SEIDEMANN, M.D., HELEN MONTAGUE, M.D., AND BEN H. BALSER, M.D.

New York City

Previous electroencephalographic studies of behavior problem children have revealed abnormalities in the brain potentials of many of the children. Jasper and his coworkers(1) reported abnormal brain function as revealed by the electroencephalogram in 71 per cent of his series; 59 per cent showed marked abnormalities with 39 per cent showing epileptiform activity. Lindsley and Bradley(2), in describing five behavior problem children, demonstrated the need of the electroencephalogram for the proper evaluation of these cases. In each case, abnormalities of electrical activity of the brain suggested an underlying disturbance of the central nervous system as a basis for the behavior disorder. Strauss and his co-workers(3) studied a group of children with psychiatric disorders and confirmed Lindsley's findings. Almost 50 per cent of their children presented diffuse cortical dysrhythmias and approximately 15 per cent, focal dysrhythmias. In a recent publication, Lindsley and Cutts(4) reported that the electroencephalograms of behavior problem children differ from those of normal children by showing a higher percentage of subjects with 2 to 5 per second waves, 5 to 8 per second waves and abnormal activity induced by hyperventilation. In addition, the average per cent of time present and amplitude of the slow waves were greater than in normal subjects. They, therefore, suggested that disturbed cortical function might be an important factor in the causation of behavior disorders.

¹ Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

From the department of neurology, Montefiore Hospital, New York, and the psychiatric clinic of the Domestic Relations Court, New York City.

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A special study therefore was undertaken of a group of children from the psychiatric clinic of the Manhattan Children's Division of the Domestic Relations Court, of the City of New York. Many children brought before the court are referred for psychiatric examination and evaluation. The presiding justice selects children for referral to the clinic, and it was felt that an electroencephalographic examination might be of some assistance in the disposition and treatment of these children.

MATERIAL AND METHODS

The group studied consisted of 28 children of both sexes ranging in age from 7 to 15 years. They were brought before the Court for a variety of reasons; some on the petition of a police officer because of larceny; some on the petition of the Society for Prevention of Cruelty to Children because of neglect; some on petition of the Board of Education for failure to attend school; but the majority, on petition of a parent because of behavior difficulties in adjusting to the home, to the school, or to both.

Electroencephalographic examinations were performed at Montefiore Hospital by Mrs. Ruth Simon. Recordings were taken from the frontal and occipital regions of right and left sides of the head in all patients. Motor, temporal and parietal leads were used when more exact localization was indicated. Small solder electrodes were used, contact with the scalp being facilitated by electrode jelly.

The subjects were examined while in a sitting position, in a partially darkened, quiet, but not sound-proof cage where they were under the direct observation of the examiner. A majority of the children were subjected to a period of hyperventilation varying from 1 to 2 minutes.

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RESULTS²

I. SEXUAL OFFENCE WITH NO BEHAVIOR DISORDER

There were two children who were brought before the Court because of sexual offences. Both children had normal spontaneous and hyperventilation records.

One was a colored boy, 7½ years of age, of dull normal intelligence, who made sexual advances toward a 5-year-old girl. Psychiatric examination revealed a normal personality. The other was a 10-year-old girl who was induced by a friend to perform fellatio upon a 55-year-old man. The child, who was of dull normal intelligence, was apparently unaware of the nature of the act she had committed. Psychiatric investigation revealed no abnormal trends.

2. NEGLECTED CHILDREN

There were 3 children in this group, all of whom showed normal electroencephalograms.

Two of these were sisters, aged 8 and 10½, who had failed to attend school. The difficulty seemed to be caused by complete lack of interest on the part of the parents. The third child, a girl of 11½, had been receiving needless beatings from her father and was referred to the Court by the Society for Prevention of Cruelty to Children.

3. BEHAVIOR DISORDERS ASSOCIATED WITH KNOWN OR SUSPECTED BRAIN DISEASE OR EPILEPSY

There were 6 children in this group of whom 4 had known or suspected organic brain disease and 2 had epilepsy. Five of the 6 cases showed abnormal cortical potentials.

CASE 1.—R. R. was a 15-year-old boy who had been manifesting bizarre behavior for several years. For a time, he spent his spare hours following death notices in the newspaper, for the purpose of visiting homes where death had occurred. He asserted that he liked to see dead people. In addition, he was extremely hyperactive. On examination, it was found that he was suffering from chronic infectious chorea associated with rheumatic heart disease and it was felt that his hyperactivity and personality disorder were secondary to this.

² Because of lack of space only representative cases from the several clinical groups are presented.

Electroencephalogram revealed diffuse abnormal activity. There was some irregularity in the alpha frequency and numerous slow waves of varying amplitude and frequency throughout. During hyperventilation, there were bursts and runs of high amplitude, 3 per second waves bilaterally.

CASE 2.—I. S. was a 12-year-old boy who was frequently truant from home and a serious behavior problem in school and at home. He frequently stole appreciable sums of money from his mother and lied constantly. Neurological examination was negative.

Electroencephalogram revealed spontaneous outbursts of high amplitude wave and spike formations originating in the right frontal region. (After this record had been taken, a history of petit mal seizures was elicited.)

CASE 3.—H. B. was a 13½-year-old girl described as completely unmanageable. Her behavior was characterized by stealing, fighting, using vile language, temper tantrums, impulsiveness, inability to concentrate. She was boy-crazy since the age of 10, destructive, rough and showed lack of interest in personal appearance. There was a history of 4 to 5 fainting attacks, one of which was associated with a generalized convulsion. Neurological examination revealed impaired coordination on finger to finger and finger to nose tests, a right central facial weakness, sluggish pupillary reactions to light and tremor of the tongue and hands.

Electroencephalogram revealed extremely poor alpha activity throughout with numerous slow waves predominating in the occipital regions and several spontaneous bursts of 3 per second waves of increased amplitude.

4. BEHAVIOR DISORDER WITH PRONOUNCED NEUROTIC OR PSYCHOTIC FEATURES

In the 6 children included in this group, the psychiatric abnormality was equally as prominent as the behavior disorder. Four showed abnormal records.

CASE 1.—G. M. was a 14-year-old girl who was a behavior problem at home and had attempted suicide. She was described as nervous and restless. At home and at school, she was stubborn, defiant and disobedient. She was emotionally labile and had frequent temper tantrums. An older brother had committed suicide when the patient was 10. She was found to be extremely unstable, tense, impulsive and flighty in her flow of ideas. At times, her speech was incoherent. Intelligence was dull normal.

Electroencephalogram was abnormal and was characterized by markedly irregular alpha activity and numerous slow waves bilaterally.

CASE 2.—V. S. was a 12-year-old girl who was adjudged delinquent after having stolen several letters containing checks from a mail box. She was described as a sickly and nervous child, but well behaved. She had had one sexual experience with

a boy of 16. She was slow and backward in school, had an I. Q. of 81, and was severely retarded in reading and spelling. She was very seclusive, rarely leaving the house except to go to the store or to school. At home, she did nothing but listen to the radio. She was considered a schizoid personality without psychosis.

Electroencephalogram showed numerous high amplitude, slow waves bilaterally alternating with runs of alpha activity of 9-10 per second frequency. During hyperventilation, there were long runs of high amplitude, 3 per second waves throughout.

CASE 3.—H. J. was a 10½-year-old boy who was truant from school and who roamed the streets, stealing food when hungry. He showed no hostile or aggressive traits. He was shy and unresponsive. He displayed no interest in his environment and could not be engaged in conversation. There was marked flattening of affect. He was of dull normal intelligence.

Electroencephalogram showed a definite bilateral asymmetry between the two hemispheres with numerous 4 to 5 per second waves predominating in the left frontal region.

5. BEHAVIOR DISORDERS UNASSOCIATED WITH OVERT ORGANIC OR FUNCTIONAL DISORDERS

In this group, there were 11 children who presented problems of varying severity, 8 showing abnormal electrical brain activity. In general, the more severe the behavior disorder, the more apt was the record to be abnormal. Two of 3 cases with normal records, presented mild disorders characterized by a single aberration.

CASE 1.—V. W. was an 11-year-old boy who had been a behavior problem since the age of 8. He had stolen on many occasions and did not seem to recognize that it was wrong. His behavior was described as infantile, eating his food with his hands, lying, running away from home, disobedient and with no remorse about any of his actions.

Electroencephalogram showed marked bilateral asymmetry with markedly irregular alpha activity, high amplitude, slow waves and bursts of 17 per second spikes on the right side.

CASE 2.—S. G. was a 7½-year-old boy who was referred to the Court after his mother had sought placement for him. He was frequently truant from school and, when there, was inattentive and troublesome. On many occasions, he had wandered away from home, stolen food when hungry and slept in hallways. He had engaged in many petty thievery.

Electroencephalogram was characterized by marked irregularity throughout with numerous slow waves. During hyperventilation, there were runs of high amplitude, 3 per second waves bilaterally.

CASE 3.—T. H. was a 13-year-old girl who had become increasingly aggressive and anti-social in

school and at home since the age of 8. She was restless, noisy, stole on several occasions and had run away from home. She had numerous temper tantrums and was suspected of having engaged in homosexual activities.

Electroencephalogram showed a predominant alpha activity of 7 per second frequency. Some alpha frequencies of 8 to 9 per second were present. In general, there was marked disorganization of activity with numerous slow waves of varying frequency and one burst of 4 to 5 per second waves of increased amplitude. There was no significant change during hyperventilation.

CASE 4.—H. M. was a 16-year-old boy who was truant from school and home. He frequented dance halls and houses of prostitution, was aggressive, overactive, disobedient and had run away from home on several occasions.

Electroencephalogram showed fairly uniform alpha activity of 9 per second frequency with occasional spontaneous bursts of 3 per second waves. There was a marked increase in slow activity during hyperventilation.

CASE 5.—L. B. was an 8-year-old boy who was truant from school and home and was hyperactive. He was of average intelligence. Under observation, he was shy, uneasy and uncommunicative. His father was a chronic alcoholic who deserted the family.

Electroencephalogram was markedly abnormal. There was continuous activity of 4 per second frequency of high amplitude in both occipital regions. In the frontal regions, there was some irregular, alpha activity of 7 to 9 per second frequency, some waves of 4 to 5 per second frequency and faster frequencies of 14 to 18 per second.

COMMENT

While the series reported here is small, we feel that the findings are significant. Five children who were examined either because of neglect or a single sexual offence had normal records. In contrast to this, 83 per cent of the children with behavior disorders associated with known or suspected organic brain disease or epilepsy had abnormal records, while 67 per cent of those with accompanying neurotic or psychotic manifestation and 73 per cent of those with uncomplicated behavior disorders of varying severity, showed abnormal cortical activity. In the latter group, the more severe cases were more apt to show abnormal potentials than the milder cases (Table 1). These findings compare favorably with those of previous similar investigations.

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We were extremely careful in the analysis of the records to take into consideration the fact that the electroencephalograms of children differ from those of adults. Only those records which showed definite deviations from normal standards which have already been established were considered abnormal (4,5,6,7) (Fig. 1).

The appearance of abnormal potentials is indicative of disturbed brain function. We feel that in most instances the nature of this dysfunction can be better determined from

TABLE I

INCIDENCE OF ABNORMAL CORTICAL POTENTIALS,
ACCORDING TO DIAGNOSIS, IN 28 CHILDREN
FROM THE PSYCHIATRIC CLINIC OF THE
DOMESTIC RELATIONS COURT OF THE CITY OF
NEW YORK

No. of cases	No. with abnormal records	Per cent with abnormal records
Sexual offence with no behavior disorder ...	2	0
Neglected children ...	3	0
Behavior disorder with organic brain disease or epilepsy	6	83
Behavior disorder with neurotic or psychotic manifestations	6	67
Uncomplicated behavior disorders	11	73
Total	28	61

history and neuropsychiatric examination than from the form and sequences of brain waves. The dysrhythmias seen in epilepsy are not specific for that condition and slow waves may be found in a variety of disorders. We prefer, therefore, to describe the abnormality and its location rather than to ascribe to the electroencephalographic findings alone a definite diagnosis. This does not imply that the brain waves are used merely to confirm the presence of disease of the brain. On the contrary, it has been the electroencephalographic findings that have spurred the clinician to search more carefully for anamnestic or objective evidence of cerebral pathology in many cases where none had been previously suspected.

This has been particularly so with such cases as have been described above. In case 2 of the organic group, no epileptic disorder

had been suspected, until close questioning, after the electroencephalogram had revealed "petit mal activity," elicited a history of petit mal attacks. "Absences" (one occurred on the way to the Hospital) had been looked upon as just another of the patient's peculiarities.

Whereas, in the past, attention had been focused on environmental and psycho-sexual factors, the importance of an organic approach has been emphasized by the electroencephalographic findings in children with severe behavior disorders. It has been recognized for a long time that epilepsy is frequently associated with conduct disorders and that changes in behavior are common sequela of brain infections. Lindsley and Cutts(8) have recently described a case of postencephalitic behavior disorder with electroencephalographic findings. Almost a year after the initial infection, abnormalities in the brain waves persisted. Clinical improvement in the patient's behavior paralleled improvement in the electroencephalographic record. Had this patient not been observed during the phase of acute encephalitis, the diagnosis might have remained obscure as it does with many of the children with behavior disorders who are brought to the attention of the courts and to the offices of psychiatrists.

How many patients with diffuse dysrhythmias are to be considered epileptic, we will not feel qualified to state until more exact differentiation between epileptic and other dysrhythmias is possible. In our series, we were unable to make any correlation between the type of behavior and the electroencephalographic abnormalities. This may be possible after many more similar cases have been examined.

SUMMARY

1. Electroencephalographic examinations were performed on 28 children who had been brought before the Domestic Relations Court of the City of New York.
2. In 61 per cent of the entire group, the brain potentials suggested an underlying disorder in brain function. When only those with behavior disorders were considered, 74 per cent showed abnormal activity.

3. These findings, which are similar to those found by other investigators, suggest the presence of an underlying cerebral disorder in a majority of children with severe behavior disorders.

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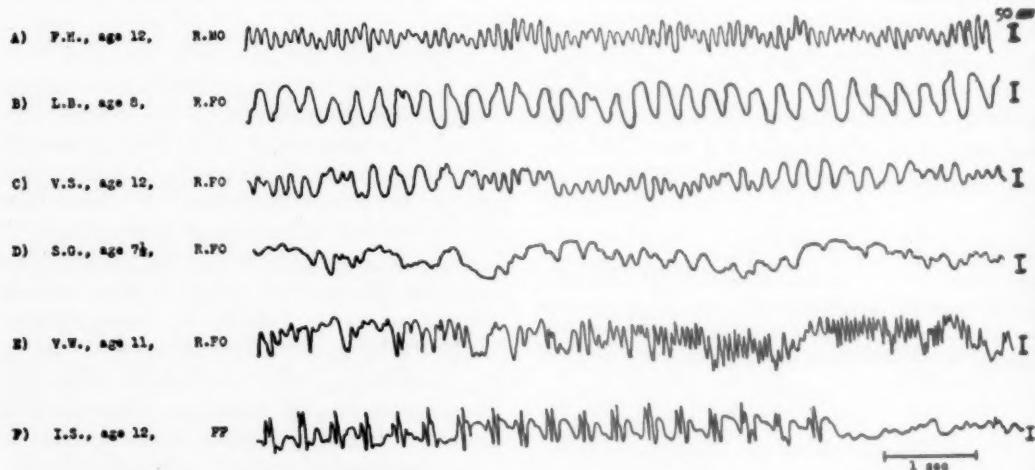


FIG. 1.—Typical samples of electroencephalograms of a normal child (A) and of 5 behavior problem children (B, C, D, E, F).

(A), a normal record, was characterized by well developed, uniform alpha activity and no abnormal potentials.

In (B), there was continuous activity of 4 per second frequency of high amplitude, obtained from both occipital regions.

In (C), bursts of slow waves of increased amplitude alternated with runs of normal alpha activity.

In (D), there was marked irregularity of activity with numerous slow waves in all leads.

In (E), the most outstanding abnormality was the bursts of spikes of 17 per second frequency from the right hemisphere.

In (F), there were spontaneous outbursts of high amplitude wave and spike formations appearing first in the right frontal region.

To the left of each record are the initials of the patient, the age of the patient and the lead from which the sample was taken. R indicates right side; FO, fronto-occipital; MO, motor-occipital; and FF, trans-frontal. The amplitude of a 50 microvolt signal is at the right of each record, and the time marker for 1 second at the bottom of the figure.

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DELINQUENCY AND THE ELECTROENCEPHALOGRAPH¹

By WARREN T. BROWN, M. D., AND CHARLES I. SOLOMON, M. D.

New Haven, Conn.

There have been reports of abnormal electroencephalographic findings in behavior problem children by Gibbs, Gibbs, and Lennox (1), Solomon and Bradley (2), Lindsley and Cutts (3), and Strauss, Rahm and Barrera (4). With these reports in mind we have begun an investigation of EEG (electroencephalographic) findings in a group of boys, 13 to 16 years of age, whose behavior has led to their commitment to a state training school for boys. We submit here a preliminary report on our first twenty cases. This is a sampling and not a statistically perfect representation.

The patients may be divided roughly into several clinical groups:

Group I (persistent severe asocial behavior). There were eleven boys belonging to this group. They gave a history of persistent severe asocial behavior of many years to a lifetime in duration continuing after admission to the state training school for delinquents. Actual delinquency is also of long duration in these cases.

Group II (sporadic and moderately severe asocial behavior with sporadic recent history of delinquency). There were six boys whose behavior difficulties and personality deviations were moderately severe and moderately conspicuous, sporadic and of only a few years duration. Delinquencies were few and of recent origin. Behavior after admission to the state school was very satisfactory.

Group III (accidentally delinquent group). Two boys are included who may be regarded as accidentally delinquent. The behavior and personality difficulties of these boys were neither conspicuous nor prolonged, their delinquencies were slight, recent and few in number and their behavior after admission to the state school has been entirely satisfactory.

The twentieth case could not be included in any of the above groups.

His only delinquency was a story of persistent running away from a county home and from several foster homes over a period of years. His progress and behavior in the public schools were satisfactory but he was regarded as a nuisance and mischief maker, and was rebellious, hyperactive and "nervous" in all of his foster homes and in the county home. His father has been in the state prison and his mother in a state hospital for many years. He always ran to a relative, uncle or aunt, whenever he left the county home or a foster home. He was finally committed to the state school for boys where his behavior has been very inconsistent with periods of quiet alternating with periods of lying, overactivity and spitefulness.

RESULTS

General.—Of the twenty cases examined seventeen patients showed some form of dysrhythmic pattern in their electroencephalograms, only three showed no dysrhythmia.

1. Psychomotor-Like Group.—Eleven of the twenty patients showed EEGs characterized by slow square-topped and irregularly shaped waves appearing chiefly from the frontal and occasionally from the central areas. These slow waves have striking resemblance to those seen in psychomotor epileptics. This has also been noted by Gibbs, Gibbs, and Lennox (1).

Of the eleven boys showing this type of dysrhythmia eight belonged to our first clinical group, those with severely asocial behavior. The other three belonged to our second clinical group.

2. Petit Mal.—Three of the twenty boys showed definite subclinical seizures of the petit mal type.

Of these one patient belonged in the first or severest clinical group. This boy had had an acute encephalitis, with subsequent hyperactive, impulsive, restless behavior (organic-drivenness of Kahn and Cohen), a left facial weakness and petit mal attacks clinically. The other two were in the second or moderately severe clinical group.

¹ From the Department of Psychiatry and the Laboratory of Electroencephalography, Yale University School of Medicine and the Connecticut School for Boys.

3. Irregularly Abnormal Electroencephalograms.—Three boys showed a definite departure from the normal in their EEGs but did not show wave forms which would place them in either of the two preceding categories. Two of these boys belonged in the first or severest clinical group. (One of them is the brother of a boy also belonging to the

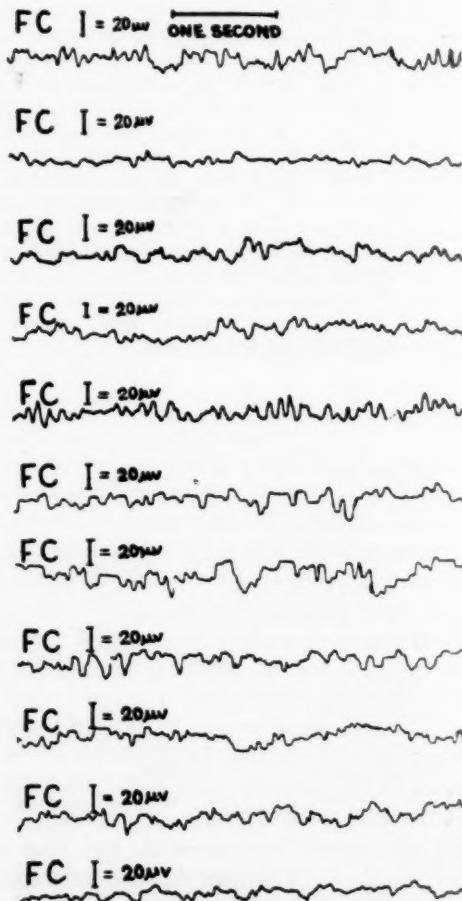


FIG. I.—A sample of the recording from the fronto-central area of each of the eleven psychomotor-like boys. Hyperventilation not used.

first clinical group, who showed psychomotor-like EEG.) The third boy with this form of dysrhythmia belonged in the second clinical group. He became delinquent only recently but he was known to be a restless, tense, worrisome boy with a facial tic and occasional outbursts of temper and periods of preoccupation and day dreaming. His behavior has been satisfactory since admission to the state school.

4. Normal EEGs.—Three cases showed clearly normal EEGs. Two of these belonged in the third clinical group, the so-called accidental delinquents. The third boy with a normal EEG is the one who did not belong to any of the three clinical groups, and was described separately above.

There were no mentally defective indi-

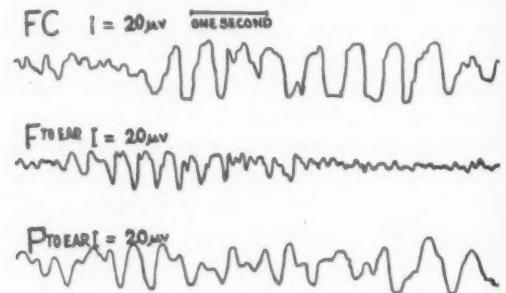


FIG. II.—A one channel sample from each of the three patients who showed subclinical petit-mal seizures. The second recording above followed five seconds after beginning of hyperventilation.

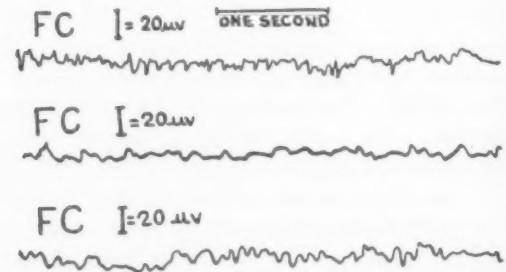


FIG. III.—A sample from the fronto-central area of each of the boys we have called irregularly abnormal. It is notable that these samples bear a resemblance to those of the psychomotor-like group. This type of wave form was not as clear or as consistent in these three as in the psychomotor-like group. The waves such as shown in these samples were also associated with irregularly formed slow waves of relatively high amplitudes. Hyperventilation not used.

viduals in the group. The I.Q.'s ranged from 75 to 127.

Clinical Evidence of Organic Brain Disease.—Four boys showed definite clinical evidence of organic brain disease. All four presented abnormalities in their electroencephalograms.

CASE I.—E. M., age 13 years, committed to the State Training School for Boys for theft and inability to get along in various foster homes and

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in school. This boy was examined by pediatricians when he was three years old. Restlessness, hyperactivity and flightiness were noted and though no definite diagnosis was made at that time the conditions considered were "brain injury, post-encephalitis and epilepsy." These symptoms persisted and at five years of age he was admitted to the Children's Community Center in New Haven because he could not be managed at home. At the age of five a psychologist was unable to give the boy a definite mental rating because his hyperactivity and inattention made reliable examination impossible. He developed the habit of soil-

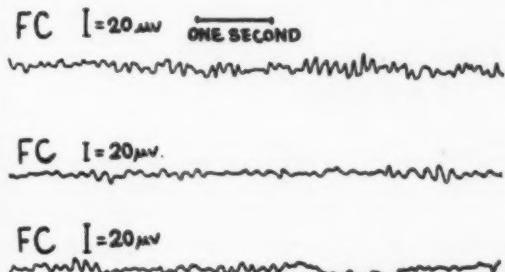


FIG. IV.—A sample from the fronto-central area of each of the boys who showed normal EEGs. Hyperventilation not used.

TABLE I

| Clinical classification                                       | EEG         |           |            |        |
|---------------------------------------------------------------|-------------|-----------|------------|--------|
|                                                               | Psychomotor | Petit Mal | Irrig. Ab. | Normal |
| Group I (severest and most persistently difficult group)..... | 8           | 1         | 2          | 0      |
| Group II (moderate group)....                                 | 3           | 2         | 1          | 0      |
| Group III (normal, accidental delinquents) .....              | 0           | 0         | 0          | 2      |
| Atypical .....                                                | 0           | 0         | 0          | 1      |

ing his clothes. He was destructive and hit other children. He was a disturbing factor in the classroom and finally persistent stealing was added to his repertoire of symptoms. In 1940 his I.Q. was found to be 75 on the Binet-Simon test and the psychologist stated that his performance showed the characteristic irregularity in function which occurs in children with organic brain defect.

Since commitment his symptoms have not changed. He has had occasional petit mal convulsions. Neurological examination revealed a left central facial weakness and a suggestion of a masked facies.

The electroencephalogram showed the pattern characteristic of petit mal (Fig. II). Within five seconds of hyperventilation 3 per second waves began to appear in all leads. Within 20 seconds after hyperventilation was begun a subclinical petit mal attack occurred lasting about fifteen seconds.

CASE 2.—S. D., 16 years of age, committed to the State Training School for Boys in July 1941 because of theft, truancy and behavior difficulties following an attack of acute encephalitis at the age of eight. Birth and early developmental history was apparently normal and no complaints about his behavior appear before the age of eight. At that time he was admitted to the New Haven Hospital because of fever, irritability and delirium, of about a week's duration. The fever subsided in about one week but he was very irritable and continued to have intermittent periods of delirium for about three weeks more. There were transient neurological signs involving the cranial nerves but these finally cleared. A diagnosis of acute encephalitis was made. Spinal fluid examination confirmed this diagnosis. After the illness the patient developed definite personality changes. He slept poorly and had many crying spells especially at night. He also developed an unusual laziness and inattentiveness and began to play truant and steal in spite of all efforts at guidance.

Examination on admission revealed no residual neurological signs but the face was rather dull and expressionless. His I.Q. on the Binet-Simon test was 91 but school work and performance on the achievement test were far below his mental capacity. He displayed no interest in the school program after commitment. He has not been a disciplinary problem but he is described as dull and inattentive and has had some inexplicable crying episodes. He has needed prodding to break up frequent day dreaming lapses. The electroencephalogram showed a diffuse epileptic picture with subclinical petit mal seizures (Fig. II).

CASE 3.—C. B., 16 years of age, committed in July, 1941, for persistent stealing and incorrigibility; an epileptic with serious personality difficulties.

This boy has had grand mal epilepsy since infancy. His convulsive attacks have gradually decreased in frequency and he has had only one major attack in the past two years. However, he has always been an irritable youngster with frequent temper outbursts which have become more violent in recent years. Stealing began at least five years ago and in spite of all efforts at guidance the boy's behavior could not be modified. Psychiatric examination in 1937 was summarized as follows: "Boy is suffering from epilepsy and his personality difficulties and stealing are directly related to this. His irritability, his rages, his sleep walking, his bed wetting and his more than average interest in religion appear to be characteristic of what is termed the "epileptic personality" and his stealing (of the compulsive type) probably is of the nature of a psychic equivalent of epilepsy." This patient frequently stole useless articles.

Neurological examination on admission was negative. The patient had an I.Q. of 102. Behavior in the State Training School has been quite satisfactory though the boy has been irritable at times and has had two or three unwarranted outbursts of temper. The electroencephalogram re-

vealed an abnormal pattern of the psychomotor-like type (Fig. 1).

He was treated with  $1\frac{1}{2}$  grains of dilantin three times a day before meals. His behavior since the beginning of treatment (about seven weeks ago at the present writing) has been entirely satisfactory.

CASE 4.—H. S., 15½ years of age, was committed to the Connecticut State School for Boys in February 1940 for repeated stealing, truancy, running away and misbehavior in school. His history includes difficult forceps delivery, intracranial hemorrhage with cerebral trauma at birth. Following the difficult forceps delivery his neonatal period was stormy, with cyanosis and convulsions during the first week of life. The boy has a residual scar on the right side of his forehead from pressure of the forceps and a marked left internal strabismus. His head is rather large in appearance suggesting an arrested hydrocephalus. The neurological examination was otherwise negative. His I.Q. is 119 and he has always been considered a bright boy but he was much retarded in school, being only in the sixth grade at 13½ years of age. He has always been hyperactive, flighty, quick moving and distractible. His home was broken up when he was five and one half years of age and he was placed in foster homes thereafter but failed to adjust for very long in any of them. He was aggressive, disrupting and inattentive in school. He ran away from foster homes, truanted, stole repeatedly and was finally committed to the Connecticut School for Boys after he failed to respond to treatment. His behavior during the two years of residence at the training school has been unpredictable, impulsive, inconsistent, with short periods of quiet followed by sudden outburst of temper, negativism, refusal to work, inattention and flightiness. He impressed us as belonging in the category of organic drivenness. Electroencephalography revealed an abnormal EEG of the psychomotor-like type (Fig. 1). He was treated with dilantin grains  $1\frac{1}{2}$  t.i.d. with the most amazing change in the boy's behavior ever recorded during his residence. However, this improvement is of too short duration to be included among those regarded as definitely improved with dilantin.

#### COMMENT

Seventeen boys of this series of twenty delinquents showed evidence of definitely abnormal cortical electroactivity. Eleven of these presented clinical pictures of severe and persistent difficulties in personality and behavior with persistent delinquency of long standing. The remaining six presented evidence of moderately severe difficulties in personality and behavior of a sporadic nature, delinquency of only recent origin and satisfactory behavior after admission to the state school.

Three of the twenty boys showed normal electroencephalograms. Two of these may be regarded as accidental delinquents.

The high incidence of abnormal electroencephalograms in this group of twenty delinquents even excluding those with histories of neurological disease suggests the strong probability of a considerable incidence in the total committed delinquent population. It is too early to attempt any detailed correlation between clinical picture and electroencephalogram but it is of interest to note that as mentioned two of the three boys with normal EEGs could be regarded clinically as accidental delinquents.

#### TREATMENT

Seven boys belonging to the first clinical group, presenting the most conspicuous behavior difficulties and grossly abnormal EEGs of the psychomotor type were chosen for treatment with dilantin. Four and one-half grains of the drug have been given daily for a period of seven weeks. Three of the boys have shown definite improvement. None of these three had positive neurological histories. Their extreme hyperactivity and inattention has become less, they have shown less excitability and fewer "flare ups" of temper and though all seem to be slower in their actions their work has become more efficient and their behavior more acceptable. In the other four boys no conspicuous or remarkable change has occurred. The boys in whom improvement was noted have had their first quiet and compliant period since their arrival at the school. Their behavior at the school had been, in each case, a continuation of a long history of difficult behavior prior to commitment. Encouraging as these results may appear they must be viewed with caution.

#### SUMMARY AND CONCLUSIONS

1. Twenty boys committed to a state training school for delinquents were studied by the electroencephalographic method.
2. Seventeen of these twenty have yielded abnormal records.
3. Of the seventeen abnormal records three suggested petit mal epilepsy, three

showed irregularly abnormal patterns, and eleven showed a slow square-topped wave formation which we have called psychomotor-like.

4. Some favorable results have been achieved in the treatment of a few of these patients with dilantin.

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## PSYCHIATRIST-SOCIAL WORKER INTERRELATIONSHIP<sup>1</sup>

By MARIANNE HORNEY, M.D., NEW YORK CITY

This paper is to concern itself with the interrelationship between the psychiatrist and the psychiatrically oriented social worker whom one encounters in clinics and family agencies. For the sake of simplification, I shall use the general term "social worker" to denote the psychiatrically oriented.

Allow me to quote a picturesque description of the relationship between psychiatry and the psychiatric social worker as given by the social worker, Bertha Reynolds(1), in May 1934. Though seven years have elapsed since, many of her points still seem applicable:

"Psychiatry begins to look like a middle-aged man with a professional beard often seen in the company of a young woman whose relationship to him is uncertain. I am much intrigued to know why they ever took up with each other, whether they are married or intend to be, or whether they are contemplating divorce. I do not think the young woman can support herself, but I have doubts whether Dr. Psychiatry is supporting her now. At times I suspect her of being more capable than she looks, and at others I am quite sure she overrates herself. I do not think that Dr. Psychiatry overvalues her, yet at times he goes off and lets her manage all of his affairs. She sometimes signs his letters with her initials. If he gets into a fuss with anyone he always wants her to fix it up. She waits on him with what looks like devotion, and then when he is not around sometimes airs a poor opinion of him. Are they heading for a closer union or a break? I do not know."

The sentence: "I do not think the young woman can support herself, but I have doubts whether Dr. Psychiatry is supporting her now," seems to me to summarize the essential problems in this relationship. We have,

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

From The New York Hospital and the department of psychiatry, Cornell University Medical College, New York.

on the one hand, the social worker setting out on independent adventures in the face of her dependency on the psychiatric profession, and on the other hand, we find psychiatry rebuffing the social worker where it is in its own interest to be able to watch her grow and assist with advice. Concern is expressed within the psychiatric profession as to whether the social worker is invading its territory without proper equipment. One current psychiatric point of view is well formulated in the following statement:

"When graduates of schools of psychiatric social work with little experience in psychiatric situations cease to work in psychiatric agencies there are two dangers—the first that the worker will forget her technique and come more and more to approach her job in a superficial way, or second, that she, because of her training and her consequent ability to see the need of psychiatric diagnosis and treatment, and in the absence of the opportunity to use psychiatrists as consultants, will herself function essentially as a psychiatrist. It goes without saying that this is a professionally unfortunate and clinically dangerous dilemma."(2)

The social worker, unconvinced of this danger, but being in a dependent position, essentially continued in the development of her rôle as therapist, meanwhile trying to appease the critical psychiatrist and allay his anxiety by various formulations. This trend is unfortunate, as it obscures the problems rather than clarifying them. In a recent publication(3) a social worker when discussing the question: "What is the relation between social case work and psychiatry?" makes the following assertion:

"In the judgment of the writer case workers do not practice psychiatry nor psychotherapy in mild versions or diluted forms. They simply do not practice it at all, except in so far as relieving inner pressures through social techniques means an understanding of frustration, anxiety, guilt and other tensions of the personality."

This denying of the social worker's psy-

chotherapeutic function by refusing the application of the term "psychotherapy" to some of the case worker's techniques, as reassurance, catharsis, working through a social worker-client relationship, helps more towards maintaining a lack of clarity in this area of overlapping functions, and seems written in an effort to reassure the psychiatrist.

Another convenient formulation often heard is that the case worker's treatment is directed to objective and social relationships and realities, while the psychiatrist deals with "intrapsychic" conflicts. Often the delineation of areas is made by allotting to the psychiatrist the field of the "unconscious and instinctual development," while the social worker deals with the social and interpersonal relationship.

Case work has been described by another social worker(4) as: "attempts to meet those needs which are derived from the interaction of the individual and his social environment and which precipitate breakdown in the individual's capacity for self-maintenance and social contribution. . . . Personality difficulties become of significance to the case worker only as they limit the individual's ability to function independently or affect his contribution to the social group of which he is a part."

Regarding this definition one may wonder what sort of personality difficulties exist that do not limit the individual's ability to function independently or do not affect his contribution to the social group. There seems to be in the social worker's mind an artificial picture of an individual with excellent social and interpersonal relationships, but still in conflict with his instinctual development: a picture which bears out a tendency to make an arbitrary and artificial distinction between instinctual conflicts and those of interpersonal relationship.

This distinction seems to arise out of a need to justify the social worker's existence on psychiatric territory, and I am sure does not correspond to the actual working concept of the average social worker, as she is well aware of the complete interrelationship in, and unity of, the individual. To understand her need to defend and justify herself we have to look into the attitudes of the psychi-

atric profession to the developing social worker.

The most apparent problem here is the divided opinions of psychiatrists in regard to the assumption of responsibility for therapy by social workers. Some have aided the development, not only by launching the worker into the field of more intensive therapy, but actively fostering its further development; while others very much oppose any therapeutic venture.

In a recent book on psychiatric social work (5) the author, a psychiatric social worker, points to the following possibility of misunderstanding: "In the discussion of this development of the rôle of social worker as therapist, two aspects should be kept clearly in mind. One involves experimental work with a given group of cases. The other is concerned with the influence upon social case work generally, the philosophy about relationships with human beings in trouble—an influence emerging from the constant desire of any social worker to improve her relationship with her client, regardless of the nature of his problem. . . . As so often happens, interest in the influence upon all case work developed long before the experiments themselves were clearly understood. Much of the misunderstanding and criticism that has greeted the concept of social worker as therapist in emotional problems has been due to a lack of understanding of the two aspects, and to premature application of concepts that appeared to be novel to the conduct of case work generally."

I should like to mention another aspect which has been touched upon by a psychiatrist(2) who states:

"'A house divided against itself cannot stand.' The psychiatric profession is coming to the realization that, if we are to live up to the high possibilities of our profession in the United States and Canada during this period of social change, we must not let a breach develop between the extramural and intramural psychiatrists. The institutional psychiatrist, the psychiatrists in public clinics, the psychiatrists in private practice, and the teachers of psychiatry in medical schools must be a unified body if we are to attain to our best possibilities."

This need for representing a more unified

body holds also in relation to the social work profession. At times, I feel that the controversies between the psychiatric schools of thought are projected upon the field of social work. At times, social work will be rejected as a profession mainly because the social workers were greatly influenced by one particular school of thought which met marked disagreement by another group of psychiatrists.

Social workers when working with a number of psychiatrists often have to feel their way carefully into the terminology acceptable to the particular doctor, a fact which does not make for a secure, spontaneous relationship.

The trend at present does seem to be towards the acceptance of a rather large borderline area of overlapping between the two professions, an area where the goals of treatment, and at times the technique, are the same.

The interrelationship between psychiatrist and social worker is a flexible one, and allows for such a variety of different combinations as to give it an intriguing therapeutic aspect. The interrelationship is most clear-cut and well defined in the setting of a child psychiatric clinic. It has been described so well and lucidly by several psychiatrists (6, 7) that I shall limit my discussion mainly to an interrelationship with the focus on an adolescent or adult.

The form of interrelationship varies. At one time, the social worker or the psychiatrist may act in a consulting capacity with or without seeing the patient, to whom the other is in a more or less close treatment relationship. At another, both may participate with equal activity.

The relationship becomes problematical mainly when the psychiatrist and social worker are active to an equal degree, or when the social worker is the main therapist and uses the psychiatrist in a consultative capacity. Accepting this latter situation, what types of cases are appropriate for the social worker to handle? References in literature to this problem are fairly meager. They mainly emphasize the degree of emotional illness of an individual. We find such statements as the one that the choice of therapist depends on how the person interviewed ex-

presses his problems; namely, in terms of his social relationship and attitude, or by means of symptomatic fears, vague pains, suspicions, doubts and unidentified feelings. The implication is that in the latter case the individual falls into the realm of psychiatry, while in the former into that of the social worker.

Speaking more positively from the social worker's point of view, there is a group of patients who are unable to attain much deep insight, but who can be reached by reassurance and practical orientation and advice. In not too rigid situations, the social worker might be able to demonstrate certain attitudes to the patient by using concrete situations she has observed, thereby giving the patient better understanding than he would have received by a more theoretical approach.

To this group of patients belong those who can not gain much insight. They need reassurance and practical guidance. Many of these patients may show rather marked emotional disturbance, but they are not suicidal and do not need hospital treatment. In most of these cases the greatest therapeutic effect is derived from a good patient-social worker relationship, rather than from the actual elucidations and interpretations given. The social worker is very capable in establishing a good relationship with the client—it has been one of the principal tools of case work.

In all of these cases, I think it is imperative that the psychiatrist retain contact, as only he can judge the implications of any psychopathological signs. The greater the reality problem, particularly that of constant economic stress, the greater becomes the need for a social worker as therapist, even when emotional problems are prominent. When a real social problem exists, it is easier for the person to project his inner difficulties on the environmental circumstances than to admit the necessity for psychiatric treatment. A social worker, by being able to tackle the problem at the practical level at which the patient presents it, has a point of entry which the psychiatrist could only find with difficulty. The social worker has the opportunity to demonstrate to the patient at what point his problems come in. She can then effect a transfer to the psychiatrist, or be able to gain the patient's cooperation by trying to develop

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helpful attitudes at the same time that she is helping and acknowledging the concrete reality situation.

If a patient under psychiatric treatment runs into environmental distress and refuses to go to a social worker, there is little cause for worry. If, however, a client suddenly produces acute emotional problems and refuses to see a psychiatrist, the social worker may be in a difficult situation. It is particularly at such points that she needs the full understanding and appreciation of the psychiatrist to whom she may turn.

The social worker-client relationship is often very sound and good and means a great deal to the client. This relationship may lend itself well to preparation for a referral to a psychiatrist, but it may also complicate such an attempt. It is important that the client does not experience the transfer as a rejection by the social worker. In a period when the client goes through a critical emotional episode, needing more than ever the support of the individual in whom he has every confidence, the case worker can do much harm by breaking the relationship because she becomes panicky, suggesting transfer to another person, a psychiatrist. This would mean robbing the patient of a badly needed support and adding another trauma. Thus the social worker cannot do otherwise but carry a patient over such a period. She can, by consultation, receive the guidance of a psychiatrist and then slowly and deliberately work towards the introduction of the client to the psychiatrist.

In situations where the social worker recognizes the need for psychiatric services for the client, but the latter cannot accept it, the social worker's services are still of value, though possibly not as effective as a psychiatrist's. She can not very well dismiss such a case from her care, but rather does the community a service by maintaining some contact. However, many emergency situations present a very trying problem to the psychiatric consultant because "the clients chosen for him to examine are most often those in whom the case worker's mismanagement of the worker-client relationship over a long period has eventuated in an acute emergency situation for the client, who has then aroused anxieties in the worker, who has

then aroused anxieties in her supervisor, who has then aroused the anxieties of the agency executive, who then decides: now we must have immediate 'psychiatric help' with this client. This is not a fair challenge to modern psychiatry"(6). We have here a plea for the earlier use of consultations which would allow a better case work management.

In a case on which both the psychiatrist and social worker spent an equal amount of time with the patient both should be clear about each other's functions; so also should the patient. The social worker and psychiatrist should communicate with each other not too infrequently, so that no misunderstanding about the direction of treatment occurs. If the direction of treatment was well understood, I seldom experienced difficulty in this joint therapy in the nature of discrepancies in dealing with the patient. There was little need for concern that the psychiatrist might not get the material first hand because the cathartic need was met by the social worker. I believe the smooth proceeding of such joint work depends as much on a good relationship between the two active disciplines as between each of them and the patient.

The social worker, as well as the psychiatrist, has to assume full responsibility for what is going on. In less clear situations each of the disciplines might otherwise feel that the major share of work lies with the other, and thus not fully orient himself as to arising needs and how these are met.

I not only feel that the social worker can be of greater help to the psychiatrist by letting him concentrate on the patients that need him and benefit from him most, but also that the psychiatrist can be of much greater service to the social worker by a greater extension of the consultation service. He can help not only with psychiatric problems, but in many quite well adjusted individuals he can aid the social worker's orientation by a more far-reaching personality evaluation.

In such consultation work it is of importance that the psychiatrist be aware of the meaning and working of social case work so that in his diagnostic impressions and recommendations he will answer the case worker's

problem, or indicate difficulties she might run up against.

By bringing about a still closer cooperation between the psychiatrist and social worker, I believe that more effective service can be given to a wider range of individuals. To effect this closer cooperation the psychiatric profession can aid a further secure, sound development of psychiatric social work by an understanding and guiding attitude. The trend in case work is to emphasize increasingly sound concrete principles with less urge towards experimental ventures. This tendency seems to limit intensive therapy by social workers to a very few individuals who are under the close guidance of psychiatrists. Thus there is hope that Dr. Psychiatry will feel less sceptical of the young woman he has associated with, giving her greater support, and making it unnecessary for her to venture out by herself in defence or disguise.

#### SUMMARY

This paper deals with the attitudes that the psychiatric and social work professions have towards each other. One notices an attempt on the part of the social workers to avoid the criticism of the psychiatrists by formulating an artificial distinction between

the two overlapping fields. The social worker's position is made difficult by her being drawn into divergencies of schools of thought within the psychiatric profession.

The main practical point arising out of this interrelationship is the need to define cases that could be carried by social workers by the therapeutic need and approachability rather than by the degree of sickness. Difficulties relating to the management of psychiatric problems arising in case work approach are touched upon.

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## NEURO-PSYCHIATRIC EXAMINATION AT THE R. I. ARMY INDUCTION STATION<sup>1</sup>

By HUGH E. KIENE, M.D.

*Director, Department of Neuro-Psychiatry, Charles V. Chapin Hospital, Providence, R. I.*

MAJOR ARTHUR S. HASSELL

*Field Artillery, State Selective Service*

AND

HIMON MILLER

*First Lieutenant, Medical Corps, Providence Army Medical Examination Station*

Since the Armistice terminating the First World War in 1918, the Government of the United States has spent approximately one billion dollars for compensation and hospital care of nervous and mental casualties suffered by our fighting forces. Many of these casualties could have been prevented by the elimination of the actual and potential sufferers from nervous and mental disease by neuro-psychiatric examination at the time of their induction into the service.

On a visit to the Base Hospital in Camp Devens, members of the army medical staff stated that mental misfits had no place in the Army as the personnel was too fully occupied giving military training to the selectees to allow time for proper diagnosis, placement and treatment of those showing neuro-psychiatric problems.

During the First World War, nervous and mental casualties were often described by the erroneous term of "shell shock." This misnomer suggests that bursting shells are responsible for the subsequent mental illness, making it easier for those so afflicted to obtain Government compensation. "Shell shock" implies that the mental disease was the direct result of military action, when in truth these same casualties would have oc-

curred had the soldier remained in civilian life. With the disability occurring in civilian life, it is highly probable, all other factors being equal, that it would not have resulted in such a chronic illness as there would be no compensation to strive for. "Shell shock" might be compared with the "railroad spine" which causes so much litigation and medical attention in civilian life.

It is estimated that the treatment and compensation of the mentally ill, or otherwise maladjusted men who were inducted into the military service during the First World War, have cost the taxpayers of the United States about \$35,000 per case. Whether mental disease is incurred during civilian or military action, its existence in the fighting forces is to be avoided by all possible means. There is no method of estimating the damage done to Army morale by the soldier who develops a neuro-psychiatric disorder.

Colonel Stanley, First Corps Area Surgeon, was asked how effective he thought a competent neuro-psychiatrist could be in eliminating at induction those men who would become nervous and mental casualties if they were to be accepted into the Army. His answer was that the induction neuro-psychiatric examination should be able to keep out of the service at least 75 per cent of the potential neuro-psychiatric casualties (Table I).

The first table consists of information obtained from the office of the First Corps Area Surgeon in Boston, Massachusetts, and covers a period of one year. During this time 40,705 men were inducted into the Army in the New England area and of these, 151 have shown evidence of mental malad-

<sup>1</sup> This paper was prepared at the request of Dr. Murray S. Danforth, president of the Providence Medical Association, and was compiled from information obtained through the cooperation of the State Selective Service, the State Induction Station and from Capt. George O. Pratt, Medical Corps, at the Army Base in Boston, Massachusetts. For more detailed information, reference can be made to the September, 1941, Bulletin of the Menninger Clinic and "The Neuroses in War," edited by Dr. Emanuel Miller.

justment, warranting their discharge from the service. The figures from Rhode Island show that 15 (9.93 per cent) of this number passed through the Rhode Island Induction Station. The figures as shown in this table are not to be considered as an accurate index of the efficiency of the neuro-psychiatric examination because there will be others in this group who will require eventual discharge from the Army because of nervous and mental disability as yet unrecognized.

From the induction neuro-psychiatric examination, the large number of maladjusted

those mentally or physically unfit for military service. It is of interest to view the State Selective Service figures of the percentage of total rejections by the Local Boards compared with the number of rejections by the Induction Board. The table shows the total rejections of Local and Induction Boards added together.

In the left-hand column the Local Boards are represented by numbers in order to prevent identification. Next appears the total number of men examined by each Local Board. In the third column is the total number of men from the Local Board examined at the Induction Station. The remaining figures are self-explanatory. At the bottom of the table one finds that 10,000 men were examined by the Local Boards, of which number 4,792 have been sent to and examined by the Induction Board. The remaining figures show the percentage of neuro-psychiatric rejections of the Local Board and of the Induction Board and the total neuro-psychiatric rejections. Following this are the total rejections of the Local Board. Next we see the total rejections of the Induction Board, and last the total rejections of both the Local and Induction Boards.

The table shows that neuro-psychiatric rejections of the Induction Board are more numerous than those of the Local Board. This is as expected since the Induction Board neuro-psychiatrist has the advantage of more adequate information concerning the selectee and also since neuro-psychiatric disorders may not be easily recognized, especially by one not trained in their recognition.

At the Local Board examination, cases showing evidence of such disorders are referred to an Advisory (Consultation) Board for an opinion. The Local Board requesting the most consultations from the Advisory Board has the least number of neuro-psychiatric rejections when its selectees come before the Induction Board. The Advisory Board chairman, when a case is referred from the Local Board, selects the various specialists who he thinks are indicated to conduct the examinations. It has been observed at the Induction Station that the nervous and mental case is often referred by the Advisory Board chairman to one of the other medical specialists rather than to the neuro-psychia-

TABLE I

*Report of Certificate of Disability Discharges for Mental Cases for the First Corps Area for the period of September 1, 1940, to September 20, 1941. This report does not include those cases discharged by their respective Division Commanders.*

Total number of discharges for mental diseases, 151.

| Induction station         | No. of discharges | Per cent of First Corps Area Total |
|---------------------------|-------------------|------------------------------------|
| Boston, Mass. ....        | 18                | 11.25                              |
| Providence, R. I. ....    | 15                | 9.93                               |
| Hartford, Conn. ....      | 13                | 8.60                               |
| Worcester, Mass. ....     | 8                 | 5.29                               |
| Portland, Me. ....        | 6                 | 3.97                               |
| Remainder of stations.... | 91                | 60.27                              |
| Totals .....              | 151               | 100.00                             |

40,705 men were inducted in the Corps Area.

young men becomes apparent. This presents an opportunity to follow up those rejected because of nervous and mental disability. Much might be done to rehabilitate those disqualified for military service by proper recognition and treatment, thus making it possible for them to receive the care which they (the selectees) had neglected to obtain prior to the discovery of their illness at induction. The large number of those appearing for examination who are rejected does not indicate that our society is deteriorating—it merely means that the military service is obtaining young men who are superior. Acceptance into the army, therefore, is an indication of fitness.

The neuro-psychiatric examination at the Induction Station is preceded by the Local Board medical examinations (Table II).

The second table demonstrates that the Local Boards vary greatly in discovering

trist. As a result, the Induction Board has more problems of this type which might have been eliminated had they been examined first by the Advisory Board neuro-psychiatrist.

A question which is frequently asked is: "How can a neuro-psychiatrist, in a few minutes, evaluate the mental and neurological

cerning the mental background of the selectee. Form 149, which accompanies the selectee to his neuro-psychiatric examination, contains his school and work record and indicates the intelligence, application and capacities of the selectee. The physical examination by the Local Medical Board is of definite value to the neuro-psychiatrist as the

TABLE II

|         | No. examined by Local Board | No. examined by Induction Station | Local Board N. P. rejections | Induction Station N. P. rejections | Total N. P. rejections | Local Board rejections, all causes | Induction Station rejections, all causes | Total rejections all causes |
|---------|-----------------------------|-----------------------------------|------------------------------|------------------------------------|------------------------|------------------------------------|------------------------------------------|-----------------------------|
| 1.....  | 336                         | 180                               | 2.7                          | 5.0                                | 7.7                    | 44.9                               | 15.6                                     | 60.5                        |
| 2.....  | 271                         | 199                               | 10.0                         | 30.0                               | 40.0                   | 38.4                               | 13.1                                     | 51.5                        |
| 3.....  | 376                         | 152                               | 4.4                          | 27.6                               | 32.0                   | 41.7                               | 15.1                                     | 58.8                        |
| 4.....  | 358                         | 203                               | 6.7                          | 37.9                               | 44.6                   | 41.1                               | 15.8                                     | 56.9                        |
| 5.....  | 411                         | 207                               | 2.8                          | 13.9                               | 16.7                   | 42.6                               | 13.5                                     | 56.1                        |
| 6.....  | 456                         | 115                               | 4.3                          | 26.0                               | 30.3                   | 50.7                               | 13.9                                     | 64.6                        |
| 7.....  | 350                         | 190                               | 1.7                          | 23.5                               | 25.2                   | 40.9                               | 20.0                                     | 60.9                        |
| 8.....  | 453                         | 192                               | 1.6                          | 12.2                               | 13.8                   | 41.5                               | 13.5                                     | 55.0                        |
| 9.....  | 358                         | 199                               | 4.4                          | 20.5                               | 24.9                   | 42.5                               | 18.6                                     | 61.1                        |
| 10..... | 238                         | 116                               | 1.9                          | 13.3                               | 15.2                   | 42.8                               | 17.2                                     | 60.0                        |
| 11..... | 232                         | 200                               | 5.0                          | 10.0                               | 15.0                   | 27.6                               | 14.0                                     | 41.6                        |
| 12..... | 280                         | 93                                | 0                            | 11.1                               | 11.1                   | 35.0                               | 11.8                                     | 46.8                        |
| 13..... | 286                         | 153                               | 3.9                          | 28.9                               | 32.8                   | 37.4                               | 13.1                                     | 50.5                        |
| 14..... | 363                         | 118                               | 6.0                          | 13.3                               | 19.3                   | 45.5                               | 15.3                                     | 60.8                        |
| 15..... | 443                         | 182                               | 4.2                          | 16.0                               | 20.2                   | 40.9                               | 19.2                                     | 60.1                        |
| 16..... | 382                         | 59                                | 5.1                          | 63.3                               | 68.4                   | 49.2                               | 11.9                                     | 61.1                        |
| 17..... | 473                         | 166                               | 3.8                          | 13.5                               | 17.3                   | 48.8                               | 15.7                                     | 64.5                        |
| 18..... | 288                         | 178                               | 2.0                          | 34.0                               | 36.0                   | 34.0                               | 16.4                                     | 50.4                        |
| 19..... | 302                         | 101                               | 13.7                         | 40.0                               | 53.7                   | 51.0                               | 6.9                                      | 57.9                        |
| 20..... | 334                         | 210                               | 5.1                          | 24.0                               | 29.1                   | 34.7                               | 12.4                                     | 47.1                        |
| 21..... | 150                         | 145                               | 6.6                          | 12.5                               | 19.1                   | 20.0                               | 14.5                                     | 34.5                        |
| 22..... | 397                         | 206                               | 4.9                          | 49.9                               | 54.8                   | 45.1                               | 18.4                                     | 63.5                        |
| 23..... | 415                         | 163                               | 6.6                          | 25.0                               | 31.6                   | 47.2                               | 14.1                                     | 61.3                        |
| 24..... | 293                         | 158                               | 6.0                          | 34.1                               | 40.1                   | 49.1                               | 15.8                                     | 64.9                        |
| 25..... | 403                         | 204                               | 6.4                          | 29.5                               | 35.9                   | 36.7                               | 17.3                                     | 54.0                        |
| 26..... | 361                         | 129                               | 18.4                         | 35.0                               | 53.4                   | 43.8                               | 17.8                                     | 61.6                        |
| 27..... | 355                         | 144                               | 15.5                         | 46.0                               | 61.5                   | 32.4                               | 16.7                                     | 49.1                        |
| 28..... | 260                         | 136                               | 1.1                          | 13.2                               | 14.3                   | 33.5                               | 10.3                                     | 43.8                        |
| 29..... | 376                         | 204                               | 5.8                          | 8.0                                | 13.8                   | 40.7                               | 12.7                                     | 53.4                        |
| St..... | 10,000                      | 4,792                             | 5.5                          | 25.1                               | 30.6                   | 41.6                               | 15.2                                     | 56.8                        |

status of the selectee?" Or another question is, "How can one say after such a short neuro-psychiatric examination that the Army can be assured the soldiers inducted will stand up under the stress of future army life?" An effort will be made to answer these questions.

At the time he sees the selectee (Table III), the Induction Board neuro-psychiatrist is supplied by the State Selective Service staff with valuable information on Forms 149 and 200. These data include a brief history which is signed as being true by the selectee under severe penalty if perjured. The history brings out pertinent facts con-

cerning the mental background of the selectee. Form 149, which accompanies the selectee to his neuro-psychiatric examination, contains his school and work record and indicates the intelligence, application and capacities of the selectee. The physical examination by the Local Medical Board is of definite value to the neuro-psychiatrist as the findings may suggest the need for further exploration. In addition, if the case had been referred, there is the report of the Advisory Board examination. If the Advisory Board neuro-psychiatrist has examined the selectee, there is usually little more required of the Induction Board examiner. Occasionally the neuro-psychiatrist of the Advisory Board is undecided whether the selectee should be rejected or accepted and leaves the final decision to the Induction Board examiner. The Selective Service, prior to the Induction Board examination, has investigated hospital admissions, police records and gathered other facts concerning the selectee, which are noted

in the record presented to the Induction Board neuro-psychiatrist. A report from the family physician is of material assistance, as he may know better than anyone else how the selectee can stand up under stress.

On the day on which the Induction Board examinations are conducted, the ophthalmologist first examines the selectee followed by the otolaryngologist, the roentgenologist, the

any suggestion of disorder is followed by a more complete neurological survey. The neuro-psychiatrist is also responsible for en-

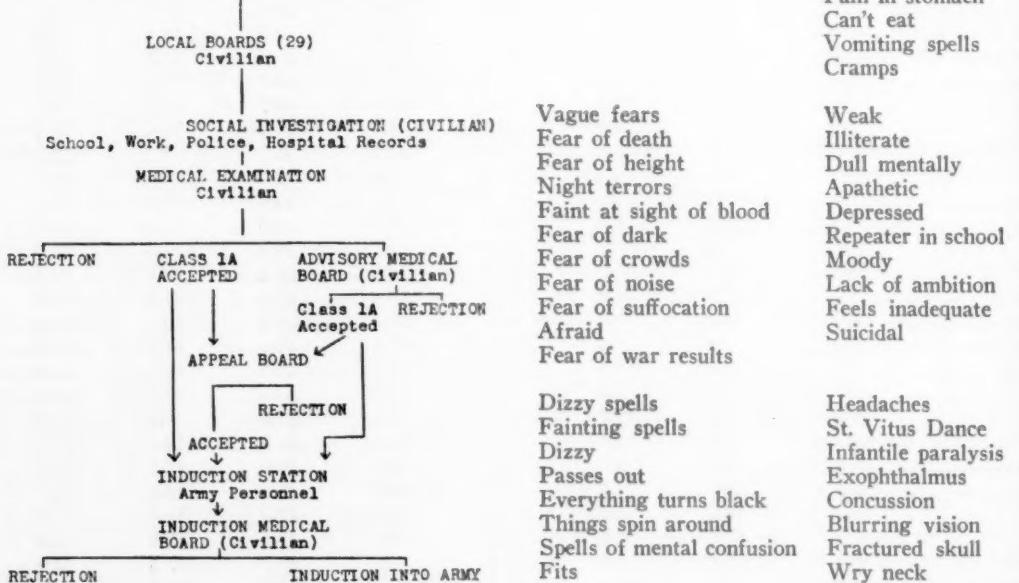
TABLE IV

These statements, symptoms and physical findings are listed in the order of frequency of their occurrence:

|                        |                     |
|------------------------|---------------------|
| Persistent tachycardia | Gas                 |
| Palpitation            | Nervous indigestion |
| Heart pain             | Chronic indigestion |
| Hypertension           | Stomach trouble     |
| Dyspneic               | Nausea              |
|                        | Nervous stomach     |
|                        | Pain in stomach     |
|                        | Can't eat           |
|                        | Vomiting spells     |
|                        | Cramps              |

TABLE III

UNITED STATES SELECTIVE SERVICE  
SYSTEM, R.I. HEADQUARTERS, ARMY PERSONNEL



surgeon, the dentist, the internist and finally, the neuro-psychiatrist. The combined findings are recorded on a work sheet which follows the selectee through the different examinations. The neuro-psychiatrist benefits by being last in this set-up, since the other examiners may and often do note observations which indicate some nervous or mental disorder. The majority of the men appearing before the neuro-psychiatrist require only a brief examination as their records show no indication of nervous or mental disorders and their appearance and behavior lead to no suggestion of maladjustment. They are asked if they have had nervous trouble or a nervous breakdown and if they have any worries, and their answers may lead to further study. The pupillary and patellar reflexes are routinely examined and

|                            |                     |
|----------------------------|---------------------|
| Vague fears                | Weak                |
| Fear of death              | Illiterate          |
| Fear of height             | Dull mentally       |
| Night terrors              | Apathetic           |
| Faint at sight of blood    | Depressed           |
| Fear of dark               | Repeater in school  |
| Fear of crowds             | Moody               |
| Fear of noise              | Lack of ambition    |
| Fear of suffocation        | Feels inadequate    |
| Afraid                     | Suicidal            |
| Fear of war results        |                     |
|                            |                     |
| Dizzy spells               | Headaches           |
| Fainting spells            | St. Vitus Dance     |
| Dizzy                      | Infantile paralysis |
| Passes out                 | Exophthalmus        |
| Everything turns black     | Concussion          |
| Things spin around         | Blurring vision     |
| Spells of mental confusion | Fractured skull     |
| Fits                       | Wry neck            |
|                            | Slurring of speech  |
|                            | Photophobia         |
|                            | Irregular pupils    |
|                            | Rotary nystagmus    |
|                            | Unequal pupils      |

|                       |
|-----------------------|
| Somatic complaints    |
| Poor heredity         |
| Imaginations          |
| Enuresis              |
| Unable to work steady |
| Schizophrenia         |
| Paranoid              |
| Jealous               |
| Hebetude              |
| Vocies                |
| Preoccupied           |

docrine diseases and notes any changes suggestive of a disturbance in this field. If a poor school record is found (as noted on Form 149), tests for intelligence are given. Illiteracy and a mental age of less than 10

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years require rejection. The work and police record give an indication of mental stability. Psychopathic personality may be suggested by frequent changes in work, by numerous arrests, or by both. Repeated hospital admissions and arrests make one think of chronic alcoholism. Neuroses and psychoses are found by direct questions and answers. The selectee's behavior, appearance, speech content and attitude, as well as the history of previous treatment or hospitalization for nervous or mental disorders, aid in the diagnosis of neuroses or psychoses. The history of convulsions and physical signs (such as scarring of the tongue) and hospital or physicians' reports, lead to the diagnosis of epilepsy. Organic brain or spinal cord pathology shows neurological signs and possibly mental symptoms.

To assist in explaining some of the findings of the Induction Board neuro-psychiatrist, tables have been prepared (Table IV).

First, the symptoms or signs as recorded by the neuro-psychiatrist on the work sheet in rejected cases, appear in the order of their frequency. These are found to fall into roughly-related groups and are thus listed. Heart symptoms, especially persistent tachycardia, has been the most frequent finding of both the internist and neuro-psychiatrist and indicates an effort syndrome or neuro-circulatory asthenia. Gastro-intestinal manifestations occur frequently, and if organic disease has previously been eliminated, are indicative of a psychoneurosis. Varying fears are recorded and are often associated with other symptoms in psychoneurosis. Mental deficiency or a depressive psychosis may be thought of with decreasing mental and physical activity. Listed also are subjective and objective data suggesting epilepsy. Symptoms of organic disease appear in the next column, and in the last are findings suggestive of a psychosis.

From these groups of symptoms and findings, a table has been prepared showing the diagnoses in the order of their frequency (Table V). These diagnoses do not necessarily correspond with those recorded on the selectee's work sheet because it was not the examiner's wish to make a diagnosis which might be misinterpreted and lead to a mental conflict in the selectee. The diagnoses listed

in the table are considered more accurate from a medical standpoint than are those recorded on the work sheet.

All that has been said so far refers to those rejected who show evidence of the neuro-psychiatric disorders listed. One of the purposes of the neuro-psychiatric induction examination is the elimination from the Army of those who would break down if they should be inducted. This is a real and extremely important problem. The prevention of all future maladjustments is impossible, but the effort of the neuro-psychiatrist is to

TABLE V

|                            |
|----------------------------|
| Anxiety hysteria           |
| Effort syndrome            |
| Mental deficiency          |
| Schizophrenia              |
| Epilepsy                   |
| Chronic alcoholism         |
| Neurasthenia               |
| Psychasthenia              |
| Psychopathic personality   |
| Post-traumatic syndrome    |
| Post-meningitis            |
| Question brain tumor       |
| Multiple sclerosis         |
| Hysteria                   |
| Paranoia                   |
| Manic depressive psychosis |

keep the number of eventual neuro-psychiatric Army casualties at a minimum. To do this requires a study of the heredity of the individual as well as a consideration of the facts previously mentioned. A man of the selective service age (21 to 28), who has made a satisfactory social adjustment, had no trouble in school, has worked steadily without frequent interruptions because of ill-health, has no police record and who shows no evidence of nervous or mental disorder, will not, in the great majority of cases, break down under the stress of army life.

One of the chief criticisms of the neuro-psychiatric induction examination is that the selectee, in trying to avoid army service, feigns mental symptoms, thus fooling the examiner. If this were the case, it merely advances the argument as to the need of trained neuro-psychiatrists at induction. In most cases the neuro-psychiatrist is able to distinguish between real and fancied mental disease; and in fact the incidence of simulation is very small. There are few malingerers

who choose mental disease as their method of avoiding military service. Those mentally ill are more prone to dissimulate their disability. Several examples might be mentioned:

A 25-year-old negro, who had been treated for dementia praecox in the neuro-psychiatric department of the Charles V. Chapin Hospital, appeared before the induction neuro-psychiatrist. This man's history, which he had signed as being true, gave no indication of his previous hospital care. The examiner recognized him but did not immediately recall the type of mental disease for which he had been treated. Finally, after questioning, the selectee described accurately his mental disease and was disappointed when rejected, as he was the only colored man in the group and had received considerable newspaper publicity about being called for the army.

Another was an epileptic who denied ever having had convulsions. He presented a drowsy appearance and scars were found on his tongue. After his case had been held for further investigation, a history of hospital treatment for epilepsy was discovered. This man has returned to the Induction Station several times since his rejection, asking to be re-considered.

There is another group who wish to get into the army in order to cure their disorders. They may have been encouraged by their families to try to get by the Induction Board. A well-known alcoholic, who had been in the hospital several times with delirium tremens, came to the induction examination in a dilapidated condition. When he recognized the examiner he began begging for acceptance as he had unsuccessfully tried everything else to cure himself of excessive drinking.

Malingering, for those who use the word, applies to men who may try to avoid military service. The mentally-healthy malingerer (if there is such a person), would be inclined to escape military service by unjustly claiming dependents. If a selectee attempts to act a mental or physical disease (the true malingerer), he is very apt to continue this method of escape when he meets the problems which

are bound to occur after he is in the Army. Therefore, he will be a problem in the service and will require considerable time and effort by the Army personnel. This is what the Army seeks to avoid. The malingerer is rare who will be an asset if inducted into the Army.

One reason why there is so much trouble with the so-called malingerer is that he antagonizes by his attempts to avoid induction into the Army, and one has a personal feeling that he should be forced to enter the service. One of the purposes of the neuro-psychiatric examination at induction is to attempt to eliminate this personal feeling and replace it by an intelligent attitude as to whether the selectee will be able to adapt himself if taken into the Army.

Neuro-psychiatric examination at induction is being conducted throughout the United States. An incongruity is that such examinations now apply only to those coming under the Selective Service Act and not to volunteers or to commissioned officers in the Army and are not used in the entrance examination of commissioned personnel of the Navy. It would seem that if a neuro-psychiatric examination is indicated in the selectee, its general use should be applied to all those entering either the Army or Navy.

To summarize:

1. The need for neuro-psychiatric induction examination is indicated from the experiences of and since the last World War;
2. Such examination, from present statistics, appears to be decreasing the number of nervous and mental casualties in the Army;
3. Malingers make poor soldiers;
4. All the military services should be strengthened by neuro-psychiatric examination before induction.

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## THE PRESENT STATUS OF DILANTIN THERAPY<sup>1</sup>

By WILLARD W. DICKERSON, M. D., CARO, MICH.

Since Merritt and Putnam announced their discovery of the anticonvulsant properties of sodium diphenyl hydantoinate (1) (dilantin sodium) and followed with the advocacy of its use in the treatment of convulsive disorders (2) (3) (4), its efficacy has been attested by a large number of papers which have appeared describing the results of the treatment of epilepsy with this drug. All writers agree that it is the equal of any of the previously known anti-convulsants and many are of the opinion that it is probably the most effective single preparation available for such treatment (37). The first reports dealt chiefly with its use after other means of control had been unsuccessful. Later, other reports on the results of the use of dilantin sodium in combination with other drugs appeared. There have been few published reports on the use of dilantin sodium in the treatment of patients with epileptic manifestations who had not been treated previously with other accepted anti-convulsant medication.

In July, 1938, at the Caro State Hospital for Epileptics we began treatment with dilantin sodium in a group of forty patients, carefully selected with regard to sex, age, etiologic factors, and seizure incidence. None had been receiving anticonvulsant medication and each had been within the institution for a period long enough to establish an accurate estimation of seizure frequency. We gradually increased our use of the drug so that, at the present time, 436 patients are receiving this form of treatment. In this paper we are reporting the use of dilantin sodium alone in a particular group of 211 and in combination with phenobarbital in 34 of these patients who previously were not receiving other medication, covering the period from July, 1938, to

January, 1941. Our experience with the drug is essentially the same as those reported by other authors. Some of the toxic manifestations we have encountered, while not essentially different, have been perhaps more severe than those reported elsewhere. We believe, therefore, that our experience in a large series of cases constitutes a fairly accurate representation of the present status of dilantin therapy. To this paper we have added an extensive bibliography of similar clinical studies for those who wish to study the subject further.

We have found that the best initial daily dose is 0.3 gram, preferably in divided doses, at meal time. This applies equally to children and adults. In the event that this dosage is insufficient, we have increased it to 0.4 and even 0.5 gram daily. A few patients have tolerated a dosage of 0.6 gram daily, although their seizures were not controlled. We have found many patients for whom 0.3 gram was insufficient but who were adequately controlled by 0.4 gram. However, we now believe that if 0.4 gram is inadequate, further increase in dosage is unlikely to yield a more satisfactory result and that it is more advantageous, because of the marked increase in the frequency of toxic reactions with larger doses, to attempt combined therapy.

Table I summarizes our experience with dilantin therapy in the control of seizures in patients who were previously not receiving medication.

The first two groups are comprised of the original forty patients mentioned, together with a few patients who were added because of other factors which seemed to make their inclusion in the group worth while. A small number of the original group were eliminated by death and because of a lack of tolerance of the drug. Five of the eight patients in the 18-24 month group were continued even though we were unsuccessful in finding an adequate controlling dosage. They were carried on extremely high doses under very careful surveillance. After a

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Va., May 5-9, 1941.

From the Caro State Hospital for Epileptics, Caro, Michigan; R. L. Dixon, Medical Superintendent.

year's trial, we began to add new cases rapidly, the newly added cases comprising the last three groups. The apparently lower percentage of successes in the last two groups is due to the fact that these groups contain nearly all of the cases who were intolerant to the drug or who, because of inadequate control, were later placed on combined therapy.

The fate of the drug within the body has not been established and it has not been

tinued the use of the drug, it is sometimes impossible to reach the degree of control previously attained. We have never found it necessary to increase the amount of the drug necessary to maintain adequate control, once that control has been established.

Shortly after we began our use of the drug, a twelve-year-old boy of low mentality developed acute appendicitis with perforation and localized abscess formation. Continuous nasal suction was established and

TABLE I  
CONTROL OF SEIZURES BY DILANTIN ALONE

| Duration of therapy in months | Number of patients |        |       | Degree of control achieved |           |           |          | Not improved | Made worse | Remission by months |          |
|-------------------------------|--------------------|--------|-------|----------------------------|-----------|-----------|----------|--------------|------------|---------------------|----------|
|                               | Male               | Female | Total | 75-100%                    | 50-74%    | 25-49%    | 1-24%    |              |            | Great-est           | Aver-age |
| 24-30                         | 20                 | 17     | 37    | 26<br>70%                  | 3<br>8%   | 4<br>11%  | 2<br>5½% | 2<br>5½%     | 0          | 26                  | 5.8      |
| 18-24                         | 6                  | 2      | 8     | 3<br>37%                   | 1<br>15%  | 1<br>15%  | 1<br>15% | 2<br>25%     | 0          | 5                   | 1.8      |
| Totals                        | 26                 | 19     | 45    | 29<br>64%                  | 4<br>8½%  | 5<br>11%  | 3<br>6½% | 4<br>8½%     | 0          |                     |          |
| 12-17                         | 31                 | 12     | 43    | 26<br>60%                  | 3<br>6%   | 5<br>11%  | 2<br>4½% | 4<br>9%      | 3<br>6%    | 17                  | 6.0      |
| 6-11                          | 36                 | 32     | 68    | 30<br>44%                  | 15<br>22% | 12<br>17% | 1<br>1½% | 9<br>13%     | 1<br>1½%   | 11                  | 2.9      |
| Less than 6                   | 32                 | 23     | 55    | 15<br>27%                  | 4<br>7%   | 9<br>16%  | 6<br>11% | 14<br>25%    | 7<br>12%   | 5                   | 1.0      |
| Grand totals                  | 125                | 86     | 211   | 100<br>47%                 | 26<br>12% | 31<br>14% | 12<br>6% | 31<br>14%    | 11<br>5%   |                     |          |

shown, except by experience, that long continued use of the drug is without harmful effects. Because of our doubt of the advisability of long maintaining a larger dose than necessary, in those cases where complete control had been maintained for from six to nine months, we attempted gradually to reduce the maintenance dose. This procedure has not proved too successful. Many of the figures in the "Remission" column would have been greatly increased and our results much more impressive had we not followed this practice. We have not discovered any ill effects from a long continued, well tolerated dose and now believe that a dosage within tolerance, even though perhaps excessive, is preferable to an occasional seizure. We have noticed that, after having discon-

dilantin therapy was, of necessity, discontinued abruptly. At about the same time another patient refused to take the medicine any longer. Both had been having a large number of attacks before medication and were taking 0.3 gram daily. The first patient's seizures were poorly controlled and he continued to experience the usual number of seizures. The second patient formerly experienced 70 or more seizures per month but was completely controlled by dilantin therapy; in 13 months since the drug was discontinued he has experienced only 2 seizures. We were surprised that neither patient developed status epilepticus with withdrawal of the drug. Since that experience we have deliberately stopped abruptly the administration of the drug in 11 cases

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previously experiencing large numbers of seizures, and in 17 other cases the drug has been discontinued abruptly because of toxic reactions. Although seizures have usually recurred, in only one instance did serial seizures follow the withdrawal. True status epilepticus was never produced.

We have been interested in the variation in response to dilantin of various groupings of our patients. We do not find that the age of the patient at the onset of attacks or that ascribed etiologic factors are of any great significance in determining the degree of response to the drug. Neither is there a significant relationship between age at the time of treatment and the efficacy of treatment. There is no tendency for the younger group to respond to a greater or lesser degree, the coefficient of correlation being  $+0.023 \pm .05$ .

Toxic signs and symptoms resulting from the administration of dilantin sodium were described by Merritt and Putnam in their first paper. Later, descriptions of other toxic reactions were added by others. The most important of these are gastric disturbances, gum hyperplasia, cutaneous reactions, changes in the blood picture, and involvement of the central nervous system, including visual disturbances. The frequency and severity of some of these have been the cause of some alarm. In our experience, as with others, toxic reactions, except perhaps hypertrophy of the gums and those due to the use of large doses in an attempt to obtain complete control, if they are to develop, occur within three weeks of the onset of administration.

Irritation of the stomach, chiefly as nausea, vomiting and heartburn, have been described as a complication of dilantin therapy. It is believed to be due to the high alkalinity of the product. In our experience this feature is so rare that it is practically nonexistent. Within the institution a wide variation in time of administration exists. Some working patients receive their morning dose  $1\frac{1}{2}$  hours before breakfast. In some cottages the capsules are given as the patients pass the drinking fountain between dayroom and dining room; in others, the capsules are distributed after the meal has begun. We know of but one instance where the drug is given after the meal. Occasionally out-

patients have complained of heartburn and eructation from the drug and have been advised to take the drug after meals.

The skin manifestations of a toxic reaction to dilantin have been variously described as either a morbilliform rash accompanied by sore throat, leucocytosis and eosinophilia, or as purpura or exfoliative dermatitis. One of our patients developed a mild urticaria. We have had no instances of purpura and but one of exfoliative dermatitis. In this patient dilantin therapy was begun during a remission of unrecognized infectious mononucleosis and led to a great deal of confusion before the proper diagnoses were established.

We have little to add to the descriptions of the skin rashes already published. It occurred in 21 of our cases. Except for five cases, all developed within 21 days of the onset of administration. As advised by Merritt and Putnam, at first we discontinued the drug with the appearance of the rash and resumed the drug with its disappearance, usually in about nine days. If, with the resumption of the drug, the rash reappeared, we abandoned its further use. Also, following the experience of Merritt and Putnam, in a few instances we continued the drug in the presence of the rash and found that in most cases, the rash behaved as before. In those cases in which the rash did not involute, it was impossible to continue the drug, even after a period of withdrawal. We still advise our extramural patients to discontinue the drug temporarily if a rash appears, but we no longer do so with institution patients under close medical surveillance. One recent case, our only fatality associated with the use of dilantin, now leads us to wonder if this may be advisable.

James A. was born after a normal labor and natural delivery. At the age of  $3\frac{1}{2}$  months he suffered a convulsion characterized by tremor of the extremities, alternating flushing and pallor of the face, hiccoughs, listlessness and upward rolling of the eyes. From that time he continued to experience seizures which gradually increased in frequency and severity. He was admitted to the Caro State Hospital for Epileptics on July 6, 1940; at that time he was 33 months of age.

Observation revealed him to be a good-natured, overactive, untidy child of normal size and physical

development for his age. He could sit and stand alone but was unable to walk without assistance. There were no abnormal findings in the physical and neurologic examinations. All laboratory examinations, examination of the spinal fluid, and X-ray studies of the skull, were within normal limits. An encephalogram revealed moderate generalized brain atrophy. Psychometric examination showed an I. Q. of 14 (Gesell) and a S. Q. of 19 (Vineland Social Maturity). His recorded seizures averaged 3 per month.

Treatment with dilantin, 0.1 gram three times daily, was begun January 1, 1941. On that day he experienced his last seizure. On February 7 dilantin was discontinued because of lesions on face and body, hypertrophy of the gums, and slight elevation of temperature. Complete blood count was within normal limits. The rash faded within a few days but his condition grew worse rapidly. He was unable to retain nourishment; glucose and saline were administered by hypodermoclysis. He died on February 15, 1941.

Autopsy was done approximately 7 hours after death. The body was that of an emaciated child whose lower abdomen, thighs, and scrotum were distended from the administration of parenteral fluids. The brain was examined at The Neuropsychiatric Institute, Ann Arbor, Michigan. Except for slight passive congestion of the lower lobe of the right lung, all organs appeared normal and were within the usual weight limits.

The Neuropsychiatric Institute reported the brain to be small and the corpus callosum, pons and medulla to be disproportionately reduced in size. There was a distinct malformation of the cerebral convolutions, most marked in the region of the Sylvian fissure bilaterally. Sections revealed outstanding malformation of the convolutional pattern, the cortex being wide and the convolutions doubled and bizarrely shaped, extending deeply into the white substance. Microscopically, there was incomplete differentiation of the normal cortical layers, the nerve cells being largely small cells devoid of cytoplasm. There were no well-defined pyramidal cells. There was a great deal of embryonic glia and reduction of white matter. The formal diagnosis was malformation, cytoarchitectural type.

Microscopic examination of sections of liver, kidneys, spleen, thymus, heart muscle, adrenal and pituitary glands showed toxic changes secondary to the primary lung pathology. Some of the lung sections showed an increase in connective tissue associated with slight round cell infiltration and atelectasis. The primary diagnosis was severe, ulcerative, desquamative bronchitis, bronchopneumonia and extensive consolidation of alveolar spaces by edema and hemorrhage.

Kimball(5) first described the hypertrophy of the gums frequently associated with dilantin therapy and ascribed it to vitamin C deficiency. In examining biopsy material from the gums of 173 of our patients, Gruhzit(41) was unable to differentiate be-

tween the hypertrophy associated with the ingestion of dilantin and that seen occasionally in others of our institution patients. There seems to be no evidence at the present time that vitamin C deficiency(26), (27) plays an active rôle in its production. However, the association between the hypertrophy of the gums and dilantin therapy is well established. Its incidence is high. Although complete figures are not available, it has occurred in well over 50 per cent of our institution cases. In 4 cases it has been necessary to discontinue the drug permanently because the excessive hypertrophy completely buried the incisor teeth. The hypertrophy has uniformly disappeared with the temporary discontinuance of the drug and has always reappeared with its resumption. As a rule, its presence is no contraindication to continue therapy as it is relatively asymptomatic and rarely causes any great inconvenience to the patient. Many are unaware of its existence.

Several writers have casually mentioned the fact that minor changes in the blood picture have occurred following the administration of dilantin. These have been described as mild leucopenia and occasional eosinophilia. Gruhzit(30) mentions that in experimental animals in the later periods of therapy an increase in eosinophilis was a constant occurrence. One case of agranulocytosis is mentioned by Aring and Rosenbaum(42) in the introduction of their article describing the effects of the ingestion of large doses of the drug.

In our experience the most common change in the blood picture is that of eosinophilia associated with the skin rash. It occurred in 14 of our 21 cases who developed a rash and varied from 5 to 23 per cent. In all cases the eosinophilia disappeared with the rash, regardless of whether or not the drug was discontinued. A small number of patients developed mild leucopenia without significant change in the differential count. We have found no significant changes in the red blood cell picture.

One of our patients developed an alarming agranulocytosis. An abstract of this case follows:

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common that of skin rash. who de- to 23 per cent. disappeared whether. A small child leuко- in the dif- no signifi- well picture. an alarming case.

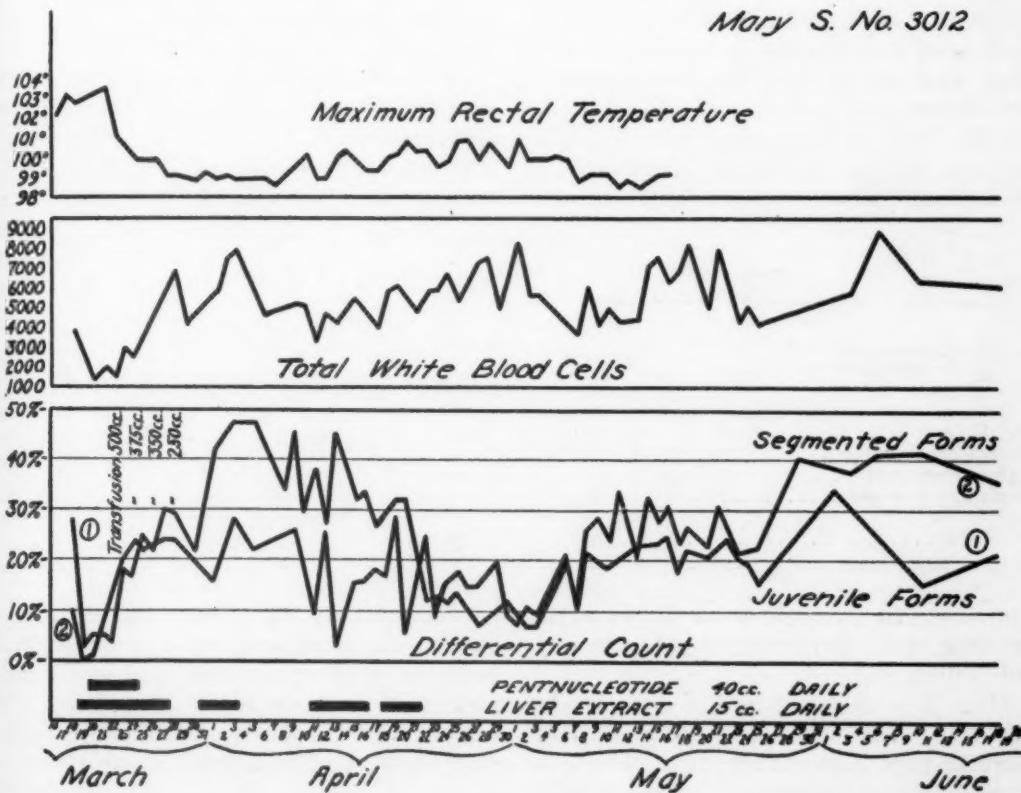
rely injure- tivity. Con-

vulsions began at the age of 20 months during an attack of diarrhea so severe as to require hospitalization, three seizures occurring the first day. Several occurred during the next few days and then an established frequency of one attack per month persisted until the age of 13, since when the attacks had occurred once weekly. This change in frequency occurred with the onset of menstruation. All seizures were typically grand mal in type, the right side being involved more than the left. She had attended school from the ages of 5 to 11 years and had reached the fifth grade.

slight anorexia. On 3-16-40 she awoke with a fever. The face, neck, and upper extremities and, to a lesser extent, the lower extremities, were covered with a pinkish-red macular eruption which faded on pressure. There was flushing of the skin between the lesions. The dilantin was discontinued immediately. The course of her illness, characterized by marked leucopenia, is summarized in the chart below.

She was paroled July 11, 1940, and returned September 27, 1940, following which a bilateral salpingectomy was done under a court order for

Mary S. No. 3012



She was admitted to the Caro State Hospital at the age of 14 (4-23-37). At the time of admission, physical, neurologic, and all laboratory examinations including skull X-rays and spinal fluid examinations, were within normal limits. An encephalogram was reported as normal. Psychometric examination revealed an intelligence quotient of 77. In August, 1938, she suffered a nodular skin rash diagnosed, after dermatologic consultation, as erythema nodosum. Otherwise her stay in the institution was uneventful. She worked in the sewing room and had frequent vacations at home. In general, she was an explosive, uninhibited girl, frequently in arguments and altercations, who averaged 6-8 seizures each 6-months' period.

On 2-21-40 she was placed on dilantin therapy, 0.1 gm. three times daily. She had been taking no medication of any kind. On 3-14-40 she experienced

sterilization. Blood studies were within normal limits at that time. She was again paroled on December 17, 1940, and has not been examined since.

Toxic effects of dilantin upon the central nervous system have been described. These have been manifested by dizziness and staggering, ataxia and dysmetria, nystagmus, amblyopia and diplopia, as well as psychotic symptoms. In this group of 211 patients, 27 showed involvement of the central nervous system as a complication of dilantin therapy.

In 11 of these 27 the effects were manifested by mental changes. Five became con-

fused, listless and lethargic. In one of these we were able later to resume the original dosage without a recurrence of symptoms. Three became aggressive, combative and abusive. In one of these patients this behavior was present with a dosage of 0.4 gram but not with 0.3 gram. One middle-aged female became extremely overactive and suffered paranoid delusions while taking 0.4 gram daily but reverted to her usual calm state when the dose was reduced to 0.3 gram. One became depressed and attempted suicide on each of two attempts to administer the drug. One girl assumed catatonic behavior with bizarre posturing.

Aside from the three cases mentioned, it was not possible to find an effective dose which would allow freedom from mental

ing use of dilantin has been closely paralleled by an increased use of phenobarbital. We have come with increasing frequency to the use of a combination of the two drugs in those cases where either drug alone does not afford complete control or where the use of either alone, while producing a complete remission, is attended by unpleasant side reactions.

Table II summarizes our experiences with those patients in whom dilantin alone was ineffective in obtaining complete control of seizures.

While this series of patients is too small to draw accurate conclusions, we believe that, in general, those patients most benefited but not completely controlled by dilantin alone are more likely to show added

TABLE II  
CONTROL OF SEIZURES BY DILANTIN AND PHENOBARBITAL

| Not controlled under dilantin therapy | Patients | Under combined therapy |                     |                          |       |
|---------------------------------------|----------|------------------------|---------------------|--------------------------|-------|
|                                       |          | Greatly improved       | Moderately improved | Little or no improvement | Worse |
| Greatly improved.....                 | 14       | 6                      | 4                   | 1                        | 3     |
| Moderately improved.....              | 10       | 4                      | 2                   | 4                        | 0     |
| Slightly improved.....                | 2        | 1                      | 0                   | 1                        | 0     |
| No change or worse.....               | 8        | 2                      | 2                   | 4                        | 0     |
| Totals.....                           | 34       | 13                     | 8                   | 10                       | 3     |

symptoms. In the eight cases intolerant to the drug, the symptoms cleared promptly with withdrawal.

Three patients complained of diplopia. In all three, reduction in dosage to a point of tolerance gave inadequate control. Five patients developed nystagmus. Three of these were taking large doses, .5 gram daily, and were relieved by a reduction in dosage of .1 gram. Two patients developed nystagmus on .3 gram daily; in both the drug was discontinued with relief. Eight patients developed dizziness and staggering. Four of these were taking .4 gram and one .5 gram daily and were relieved with the reduction in dosage. The remaining four were free of symptoms on .2 gram daily but were poorly controlled.

We do not wish at this time to compare the relative merits of phenobarbital and dilantin (36) in the control of epileptic manifestations. In our experience, our increas-

improvement by the addition of phenobarbital to the dilantin therapy. In a smaller series of cases we are now studying, it appears that the same is true of patients not responding completely to therapy with phenobarbital, when dilantin is added.

#### DISCUSSION

There is no doubt that dilantin sodium is one of the most effective drugs known in the control of epileptic seizures. Its effects are prompt and frequently spectacular, especially in those patients experiencing frequent seizures. It is not unusual for such a patient's seizures to be remitted within twenty-four hours of the onset of therapy. However, this is by no means the rule. In many patients partial control was established with a dosage of 0.3 gram daily and complete control by 0.4 gram. In other patients, no demonstrable effect was obtained with 0.3

gram while complete or nearly complete control was obtained by an additional 0.1 gram daily. However, the response to any given dosage is prompt and it is possible to determine within a comparatively short period of time the effectiveness of the dosage in question. We have not been able to demonstrate any cumulative effect after long periods of ingestion. Our medical and nursing staff have commented on the great reduction in the number of patients requiring treatment for contusions, lacerations, and fractures since we began the use of dilantin on a large scale; this is probably due to the fact that we have selected for treatment chiefly those cases experiencing the largest number of seizures.

Ross and Jackson(40) of our staff studied the influence of dilantin and conduct and on psychometric ratings in 73 of the patients included in this study. They found that conduct was improved in slightly less than half, that there was no significant influence on intelligence ratings and that performance ratings were raised appreciably in a small percentage of patients. The drug seemed to have a greater beneficial effect on performance than on intelligence ratings. We have frequently stated informally that it is the conduct of the epileptic patient, rather than his seizures, that leads to his being committed to an institution. We do not doubt that this conduct is often due to the insecurity and ostracism brought about by his seizures and that relief, by whatever method obtained, brings a marked improvement in behavior. We also believe that in a few instances the patient is irritable and combative because he does not have seizures. From such a patient, we frequently hear the remark that he would feel better if only he could have a seizure. We believe that this phenomenon of relief from tension by the attack and the converse of unrelieved tension due to the absence of seizures explains the worsened conduct of some patients and many of the psychotic manifestations which appear with the use of the drug.

The most marked advantage of dilantin over phenobarbital is that it does not produce drowsiness. In only two instances did the patient become sluggish. We know that in many instances it is possible to obtain a

complete remission from seizures with the use of phenobarbital alone. Our chief objection to its use lies in the high incidence of drowsiness, confusion, and increased irritability which attend its use. We have not been able to employ doses of the magnitude used by Lynch(43) and Pratt(44). The use of dilantin as the basal anticonvulsant supplemented when necessary by small doses of phenobarbital is our treatment of choice.

The disadvantage of dilantin lies in the high incidence of toxic reactions resulting from its use. Fortunately, many of these reactions are mild and transitory in nature. With the one exception mentioned, all of the unfavorable reactions responded promptly when the drug was withdrawn and many patients were later able to resume their use of the drug with marked benefit to themselves. The toxic reactions appear early in the course of treatment and in the brighter, more alert patients are usually preceded by mild prodromal symptoms which forewarn of their onset. It is quite likely that some of the unfavorable reactions could have been averted had we been treating a similar number of patients with a higher average of intelligence. Outpatients have returned, probably because of our warnings of the possibilities of unpleasant reactions, complaining of vague feelings of uneasiness. A reduction in dosage for a few days with relief of symptoms followed by resumption of a full dose has been a satisfactory practice and the incidence of toxic reactions is not as high.

Because of the frequency of these reactions, the treatment of epilepsy with dilantin becomes a highly individualized procedure. The patient should be under very strict medical supervision during the first month of treatment. During this time white and differential counts should be done twice weekly. At the first sign of indisposition, the dosage should be reduced and even discontinued if the symptoms are not ameliorated. With the resumption of the drug, if not contraindicated, only a short period to determine the efficacy of the drug for the individual is necessary unless the seizures are so infrequent as to make this inadvisable. If a controlling dose within tolerance cannot be found, phenobarbital in small doses

should be added until remission has been attained.

### CONCLUSION

1. We believe that, at the present time, dilantin sodium is the most effective single preparation available in the treatment of the convulsive manifestations of epilepsy.

2. Although toxic manifestations are frequent and sometimes severe, careful clinical observation and laboratory studies will decrease their incidence and withdrawal of the drug or reduction in dosage will afford prompt relief.

3. The use of small doses of phenobarbital in combination with dilantin offers an additional possibility for the control of seizures when dilantin alone is insufficient to attain that end.

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### DISCUSSION

A. J. ARIEFF, M.D., AND I. FINKLEMAN, M.D., CHICAGO, ILL.

Up to the first of the year there were 44 patients treated with diphenyl hydantoinate in the clinic for epilepsy of the Northwestern University Medical School. Of the 44 there are only 7 being actively treated now while 37 had to be discontinued from dilantin therapy. Of the 7 patients, 6 have been spell free for periods ranging from 10 to 17 months and 1 is spell free up to two months at a time.

Of the remaining 37 patients, 8 were taken off of treatment and hospitalized when they developed severe neuropsychiatric disturbances such as stuporous and comatose states, psychoses, status epilepticus and peripheral neuritis. Eighteen had severe complications and showed no improvement in their frequency of spells. Two patients refused medication because of unpleasant subjective sensations. In 3 the frequency of spells increased. Six were unimproved.

Cardiovascular reactions included subjective complaints of precordial distress and objective electrocardiographic evidence of myocardial changes. In 27 cases followed by serial EKG., all but two showed definite changes on maximal dilantin dosage for each individual patient. Thirteen or approximately 50 per cent showed prolongation of the P. R. interval of from .02 to .04 second.

Twenty-one or 78 per cent showed a decrease in T wave amplitude. In 3 cases there were P wave changes and in one case there was marked alteration of the Q. R. S. complex. In all cases after the drug was discontinued the EKG. pattern returned toward the normal.

Severe gastrointestinal disturbances were present in 3 patients. There was an increase in serum phosphatase during treatment.

## A STUDY OF FRONTAL LOBOTOMY

**NEUROSURGICAL AND PSYCHIATRIC FEATURES AND RESULTS IN 22 CASES WITH A  
DETAILED REPORT ON 5 CHRONIC SCHIZOPHRENICS<sup>1</sup>**

By EDWARD A. STRECKER, M. D., HAROLD D. PALMER, M. D.

AND

FRANCIS C. GRANT,<sup>2</sup> M. D.

*Philadelphia, Pa.*

### I. DR. EDWARD A. STRECKER

Among the drastic therapies applied to mental disorders the operation of pre-frontal lobotomy is one of the most drastic though not the most hazardous. Probably, like the other drastic therapies, in this field, its development and application were stimulated by the demand for more direct treatment of the large static segment of certain psychoses; by the swing of the pendulum somewhat away from psychotherapy; by the impact upon thinking of the achievements of an outstandingly technical era in our civilization possibly conditioning in medicine a renaissance of pharmacological, chemical, electrical and other techniques, and finally by the lengthening of psychiatric lines of communication resulting in larger contacts with various medical and surgical disciplines.

In the use of this operation we preferred not to work exclusively in the commonly selected field of the melancholias of late middle life, but also applied the operation in a limited and unquestionably chronic area of schizophrenia. The criteria of chronicity and malignancy in the cases of schizophrenia were very rigid: long duration; so-called "deterioration"; lack of clinical response to other drastic therapies; a particular symptomatology impregnable to management or even approach, rendering the state of the patient well-nigh intolerable and quite disruptive of hospital morale.

Later in this discussion Dr. Grant will

summarize the results in 16 cases of agitated involutional melancholia and in one case of sexual psychopathy. My remarks will deal with the five chronic schizophrenic patients, four women, two single, one married and one divorced, and one single male. The age range is from twenty-five to thirty-nine years; the shortest pre-operative duration of psychosis was five years and the average almost ten years. The briefest post-operative observation period has been one year; the longest two and one half years.

The psychotic patterns were basically schizophrenic but the group was distinguished by the fact that the psychotic life was not on an inactive level but tended to be stormy and violent, with vivid hallucinatory experiences motivating apprehension and severe panic reactions of sufficient intensity to induce suicidal attempts, self-mutilation, destructive, aggressive and homicidal impacts, restlessness, irritability, noisy excitability, refusal of food, unwillingness to tolerate clothing, etc.

With any technique used in this category of cases, criteria of clinical accomplishment are far from satisfactory. In prefrontal lobotomy recovery must not be expected. All the patients "improved": one male patient only to the extent of disappearance of violence and destructiveness so that he is a more conforming institutional patient; in one female but little more than this. In the three remaining females the gain was considerable: one remains in the hospital but her life has been raised from as unsatisfactory a level as one may witness to one of interesting activities; the second is able to live outside the hospital without a nurse on a fairly satisfactory plane including a resumption of former social contacts; the third, apparently

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

From the Medical School, University of Pennsylvania and the Institute of the Pennsylvania Hospital.

<sup>2</sup> By invitation.

is free from symptoms and has married and had a baby, though of course against our advice.

In our opinion at least a year should elapse after operation before even preliminary judgment is made since it is possible that this time is needed for brain tissue adjustment.

More significant than the relief of certain psychotic symptoms and more provocative of further investigations are the post-operative emergence of behavior strata not visible before, and seemingly the salvaging of pre-psychotic material which would have been adjudged irretrievably lost.

The outstanding clinical result was the disappearance in very large degree of destructive and dangerous clashes with the environment. Psychological testing did not reveal measurable post-operative intellectual defect. In general, emotional responses appear to have been freed or, at least rendered more flexible. Contrary to the accepted opinion concerning the inhibitory reduction and super-ego blunting in frontal lobe pathology, two of our patients regained a considerable measure of inhibitory function and self-critique, and two others profited in lesser degree. There seem to be qualitative personality alterations or, perhaps, restorations, determining social adaptabilities. In two patients former disregard of others has been replaced by manifestations of thoughtfulness, consideration and generosity. Pre-psychotic artistic capacities and inclinations and skill in games athletic and non-athletic have been strikingly revived in two patients and partially in one. One of the patients exhibited resourcefulness and common sense of which she would have been utterly incapable before the operation. A friend with whom she was horseback riding, was thrown from her horse, fractured a forearm and became unconscious; the patient applied first aid, tethered the horses, stopped a passing car, accompanied the unconscious woman to the nearest hospital, notified her family and remained at the hospital until her friend had regained consciousness and was pronounced out of danger.

In three patients, either there appeared or there was resumed the capacity to anticipate

the future, visualize it usually pleasurable as in the matter of trips, cruises, theater, etc.

Two patients who had auditory hallucinosis so pronounced that it led to urgent appeals for surgery to produce deafness and for euthanasia and to suicidal attempts claim complete cessation of the voices. We doubt it in one instance. Auditory hallucinations continue in three patients, but certainly in two of them with far less preoccupation, ready distractibility from "listening" and with some evidence of insight as in this statement, "I know they are imaginary voices and it is silly of me to pay any attention to them."

In all but one of the patients and strikingly in two, there was reclamation of former life material, prompting some measure of reorientation and realignment with family. On the other hand, there is a highly qualitative and almost wishfully selective loss of temporal appreciation. One patient, psychotic for fifteen years, frequently declares that she must have been ill "for a whole year" and naively inquires for her friends, which ones have been married, etc.

Another patient, seemingly has succeeded in erasing the memory of many years of psychotic illness, emphatically dismissing it as not a "real" sickness, "doctors always make a big fuss over nothing."

In four patients there were enormous increases in appetite. Two patients gained slightly in weight but in three the gain was respectively 35, 51 and 49 pounds. These three patients display an almost humorous attitude toward fat and the loss of figure.

One patient had transient manifestations of "Witzelsucht" and boisterous hilarity and continues a rather vulgar enjoyment of food.

In general pathological inertia, in those patients who exhibited it before the operation, has disappeared and in three patients there has been a replacement by extraverted activities, with heightened distractibility and suggestibility, possibly indicating a loss of inhibitory function. The tendency is to derive more pleasure from simple things in those who in their prepsychotic life were relatively sophisticated. Now the interests are apt to be a horse, a dog, an ice-cream cone, a movie, with obvious satisfaction in things as they are and a livelier interest in entertainment

and "doings," rather than in intellectual and artistic pursuits. There is often vagueness and impaired judgment, more evident in relation to temporal distortion than in ethical consideration.

Naturally, the literature is meager and based largely on correlations between frontal tissue pathology and observed behavior. It has been pointed out that unilateral destruction of the frontal lobe produces no significant symptoms, but in bilateral trauma, personality and behavior both in normals and psychotics are affected. It has been inferred that the frontal lobes have to do with the functions of synthesis, inhibition and control. Furthermore, it has been suggested that the frontal lobes are concerned with a projection of the individual as a whole into the future, with the formation of an image of the individual as he is becoming; with lesions there is a loss of self-critique, ready satisfaction, lack of social sense and impairment of self-imaginative perspective. It seems to be fairly generally believed that the functioning of super-ego is dependent upon frontal lobe integrity. A quantitative diminution of function and behavior has been predicated.

The post-operative reeducation and rehabilitation of patients subjected to frontal lobotomy are of the utmost importance and must be energetically carried out. The disruption of certain long established habits, cutting of association pathways, the consequent reduction of the self-critical and self-evaluation capacity, lessening of initiative and ability to plan, all make reeducational efforts imperative. The post-operative patient is malleable. The program is one of gradual expansion beginning with relatively simple things and progressing during the first year toward the goal of the highest level which the prepsychotic mind and personality was able to attain.

Finally, if, as our studies would seem to indicate, the conceptual content of the hallucinosis was removed from its vivid matrix of emotion, then there should be further attention and research by the many workers who from neural, somatic and psychological angles are concentrating upon the supreme expression of the personality and probably the most important aspect of the totality of man—the emotions.

## II. DR. HAROLD D. PALMER

It should be emphasized that Dr. Strecker, Dr. Grant and I do not approve of the general use of this operation as a standard method of treatment applicable to any large section of psychiatric practice. It is a mutilating operation and the association tracts and other cerebral tissues once interrupted or destroyed can have no return of function. The operation is a procedure of last resort to be performed only after other therapeutic methods have proved fruitless. In the agitated depressions and the schizophrenics reported here, other methods of therapy including some of the more drastic techniques had been attempted and had proved futile before any consideration was given to frontal lobotomy. The five chronic schizophrenics were all treated by a variety of drastic therapies over a period of years, and only after the psychosis had proved to be resistive to all other methods, and only after the appearance of irreversible deterioration, was frontal lobotomy undertaken. The detail in the cases of the five chronic schizophrenics can be summarized as follows:

CASE I.—A woman, age 39, a divorcee, ill with schizophrenia for twelve years before operation, had been under our observation for seven years. The postoperative period has been twenty-two months. The psychosis was characterized by excitability and impulsive violence, several suicidal attempts, refusal to eat, and very distressing auditory and tactile hallucinations. In fact, her distress was so great that she begged that both auditory nerves be cut to eliminate the abusing voices and that a mutilating sexual operation be done to remove the distress of tactile hallucinations involving the sex organs. Deterioration was obvious in that she had apparently had no intellectual life during the last seven years, whereas prior to the onset of her illness she had graduated from college, had a real interest in literature and was adept at languages.

Narcosis treatment in 1937 failed to bring about any change. Insulin therapy (fifty-one treatments with forty-two comas) produced slight temporary improvement, but she relapsed so severely that insulin therapy was repeated after nine months. This time she was given forty insulin injections with twenty-three comas. No improvement followed this treatment. After seven months she was given eighteen metrazol convulsions and three azoman (3-ethyl-4-cyclohexyl-1,2,4-triazol) convulsions; no benefits were derived from these methods. Frontal lobotomy was performed by Dr. Francis C. Grant on June 20, 1939. The immediate result of the operation was a serene mental attitude with rather a remarkable talkativeness. After three months she was allowed to go home with a nurse, and, as Doctor Strecker has stated, she has been living

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at home in a relatively satisfactory social adjustment, without the nurse. She has a mildly distorted sense of time relationships. Her naive attitude toward temporal orientation is illustrated by the fact that although she has been sick for longer than thirteen years she believes that she has been ill for a year. She has gained 40 pounds (18 Kg.). A severe hypotension, which existed prepsychotically as well as during the course of the psychosis has disappeared and blood pressure has returned to normal.

**CASE II.**—A woman aged 26 had been psychotic for twelve years and had been observed by us for five years before operation, and for fifteen months postoperatively. Prolonged endocrine therapy, narcosis treatment and insulin therapy with forty periods of coma had brought about no improvement. The psychosis was characterized by fear of kidnapping, and violent assault. She attempted to jump out of windows, smashed all the furniture in the house, attacked nurses with tremendous violence and was restrained with great difficulty.

Frontal lobotomy was performed by Dr. Grant in November 1939. The immediate results were very encouraging. The patient was talkative, pleasant, affable, cooperative in an extreme degree. Her appetite, which had been almost nil before the operation—in fact she had required artificial feeding—suddenly became exaggerated and in the first six months postoperatively she gained 49 pounds (22 Kg.). She read books with her nurse, worked at arts and crafts, and manifested interest in her environment, going for rides and walks and enjoying relatively simple things. As Dr. Strecker has reported, it is not felt that she approached her prepsychotic level of intellectual interest. An attack of virulent pneumonia resulted in death eighteen months after the operation.

**CASE III.**—A single man of 35, had been under the observation of psychiatrists at the Pennsylvania Hospital for six years prior to operation and for one year after operation. His behavior was combative, violent, impulsive, and at times homicidal. He attempted to mutilate himself, burned his skin with cigarettes, beat his head against the wall, was incontinent and untidy.

Narcosis followed by typhoid vaccine, insulin treatment and sixteen metrazol convulsions all failed to bring about anything but a transient improvement. Operation April 25, 1940 by Dr. Grant produced a high degree of affability and cooperativeness, complete freedom from violent outbursts, and freedom from the violently aggressive attacks. The patient began to renew his interest in card games and checkers and in occupational therapy. During this postoperative year, however, he has remained on a relatively simple level. Although he goes home occasionally he is passive, extremely suggestible and accepts everything with an entirely uncritical attitude.

**CASE IV.**—A woman of 32 under our observation for thirteen years prior to operation and for fifteen months after operation. The onset of the illness

was typical, with withdrawal and quiet preoccupation. Gradually there appeared hallucinations, which increased in acuteness and in their distressing nature until she became combative, violent, destructive and on one occasion attempted suicide by jumping out of the window. The restlessness was so intense that exhaustion seemed inevitable, and she was several times given narcosis treatment as a means of controlling the agitation and excitement. In 1937 she was given insulin therapy and had forty-six treatments with thirty-four comas. She gained a great deal of weight during this treatment but showed no mental improvement. A second course of insulin therapy seven months later produced no improvement.

Frontal lobotomy was performed by Dr. Grant, Jan. 15, 1940. The immediate postoperative results were not very encouraging. She remained quiet, entirely passive, very suggestible. Her interest could be aroused for temporary periods, but she quickly lapsed back into what appeared to be preoccupation with fantasies and possibly with hallucinations. However, in the fifteen months since operation she has made very striking improvement. She has gained 45 pounds (20 Kg.), has lost her fatigability, seems more energized. As Dr. Strecker has reported, she now goes swimming, bicycling, horseback riding, does very skillful weaving and knitting, and has taken up sculpture and painting, at which she was very competent in her prepsychotic life. She apparently has lost none of the skill which seemed to have disappeared entirely through schizophrenic deterioration. She has learned new games and has taught them to others. The time sense of this patient is peculiarly distorted. She, like patient 2, is astonished to learn that she has been sick longer than a few weeks. In talking with the nurse she said that she might have been ill for one year. Actually it is more than fourteen years.

**CASE V.**—A woman, aged 25, was under psychiatric observation for five years before the operation and for two and one-half years after the operation. There was a long history of educational and social maladjustments, years of moral laxness, rudeness, resentment, suspiciousness, obstinacy and irritability before the psychosis. Shortly after the onset of the psychotic phase she became paranoid and had ideas of reference, delusions and auditory hallucinations. There were episodes of violence, and destructiveness. She attempted to commit suicide by setting fire to her clothing and by cutting her wrists.

Narcosis treatment of ten days' duration produced no improvement. Insulin therapy, consisting of fifty-one comas, produced no benefit. Because of the tremendous difficulty in management, the increasing excitability and the destructiveness, frontal lobotomy was performed by Dr. Grant, Oct. 14, 1938. In the immediate postoperative phase this patient also showed little improvement. Gradually over a period of two and one-half years, however, the improvement has become very substantial. She obtained a position one year after the operation as a hostess in a resort and functioned very satisfactorily. She learned to play golf and was able to enter into highly competitive golf tournaments. She seems to have

retained all of her intellectual capacity, and the comparison of psychometric tests before and after operation shows no change except that the Rorschach test shows a more normal response after the operation.

Quite apart from the amelioration of symptoms, which in 14 cases out of 22 was very substantial, there are more provocative aspects. Particularly in the schizophrenic cases material is provided for prolonged study along several interesting lines. The restoration of normal mental content and artistic capacities thought to be lost by deterioration, the marked release of more evenly flowing energy which is distributed in better organized extraverted channels, the improvement in autonomic functions, all require considerable thought and interpretation. The tremendous gain in weight is of special interest because the body contours and fat distribution suggest pituitary adiposity. Also the abnormal appetite, which at times becomes a desperate hunger, resembles the clinical picture of hyperinsulinism. Interference by the operation, with certain hypophyseal connections either directly or indirectly by way of the thalamus, must be considered as a possibility. The release from pituitary inhibition could give rise to a pancreatic islet hyperactivity sufficient to account for clinical hyperinsulinism.

The general energy release following lobotomy seems to be attributable to some loss of physiological inhibitory frontal lobe function. Whether this corresponds measurably to lightening the load on the brain energy, by relieving it of some of the heavily burdened circuits of the frontal lobes must be determined by future study and experiment.

In the agitated depressions there was not only a diminution of agitation and a loss of the enormous affective disturbance but actually there appeared almost wishful forgetfulness toward the ideas expressed during the psychotic episodes. The patients preferred not to discuss the distressing delusions of sin and wrong-doing, dismissing any attempt to review the psychotic illness by saying "that is all over and was very foolish." In some instances patients were almost unwilling to believe that they had ever expressed such ideas of hopelessness

and such delusions of sin. Introspective self-analysis lost its intensity or entirely disappeared. The intense mental energy which is so marked in the agitated melancholias seemed to have been reduced so that agitation was replaced by composure, and despondency was replaced by a feeling of contentment or self-satisfaction. Freeman and Watts(5) noted a cheerfulness and euphoria which we have only occasionally observed in our cases of agitated melancholia.

### III. DR. FRANCIS C. GRANT

The surgical treatment of certain mental diseases is slowly but steadily proving its value. Moniz(1) in Portugal was the first to point out that section of the frontal association fibers would improve mental symptoms in carefully selected cases of certain types of psychoses. The physiologic basis for these observations has been established by the well-controlled experimental work of Fulton and Jacobson(2) on apes and the detailed studies of clinical cases by Brickner(3) and Ackerly(4). Moniz's claim for the effectiveness of surgical intervention has been confirmed in this country by the reports of Freeman and Watts(5) and Lyerly(6). It is not our purpose to discuss in detail the physiology behind the surgical results. We are frank to admit that surgery seems a potentially dangerous and definitely brutal method to use in the treatment of mental dysfunction. It is to be hoped that other and simpler means of therapy will be devised. But there is no denying the fact that surgery is sometimes effective and must be considered when the treatment of such conditions comes under consideration.

Briefly, the effect of surgical section of the frontal association tracts can be summed up in the phrase "relief of apprehension." If the mental condition is produced or aggravated by fear, then this factor in the patient's mental reaction can be eliminated by pre-frontal lobotomy.

The operative results in our small series of cases are shown in the table on page 529.

The operative procedure used is simple. The hair is shaved bilaterally anterior to the vertex. Avertin is the anesthesia of choice in these operations although in cooperative patients local infiltration of the skin with

novocaine is sufficient. The most posterior part of the curving lateral wall of the orbit is identified and a line parallel to the zygoma is traced on the skin with dye at this level. At a point along this plane, three centimeters behind the posterior edge of the lateral orbital ridge, a perpendicular line is drawn running up from the upper edge of the zygoma. At a point five centimeters above the zygoma on this line a dot is made on the skin with the dye. This same measurement is made bilaterally. It is important that the marker on the skin should be placed as nearly symmetrically as possible on each side so that the trephines and cortical incisions are

#### TOTAL CASES 22

|                           | Agitated and<br>depressed, 16 | Schizo-<br>phrenia, 5 | Sex<br>problem, 1 |
|---------------------------|-------------------------------|-----------------------|-------------------|
| Sufficiently recovered to |                               |                       |                   |
| leave institution         | 12                            | 2                     | ..                |
| Improved                  | 1                             | 3                     | ..                |
| Unimproved                | 1                             | ..                    | 1                 |
| Dead *                    | 2                             | ..                    | ..                |

\* One from avertin. One from post-operative hemorrhage.

on the same level in each frontal lobe. To assure this a stab wound is now made over the marker, a small chisel introduced and a nick made on the bone. Local anesthesia in the skin about the marker to desensitize the line of incision will distort the skin and with it the position of the marker. Hence the necessity for a landmark on the bone itself. After infiltration of the skin with novocaine an incision about  $1\frac{1}{2}$  inches long is made perpendicular to the zygoma. Self-retaining retractors are inserted exposing the bone. The nick on the bone should have been placed directly on or within a half centimeter of the coronal suture. Trephine openings are now made with the Hudson drill to an extent of  $1\frac{1}{2}$  cms. and the dura opened. The arachnoid is entered and an avascular area selected on the cortex. A calibrated hollow needle is now introduced in such a way that if it were pushed in far enough it would emerge through the trephine opening on the opposite side. Great care should be taken to have the needle in exactly the plane of the contralateral trephine both horizontally and perpendicularly. At a depth of from  $5\frac{1}{2}$  to 6 cms. the falx is encountered or the anterior horn of the ventricle may be entered

before the falx is reached. If the falx is met without entering the ventricle, the needle is withdrawn  $1\frac{1}{2}$  cms. and the depth from the surface carefully noted on the needle shaft. A narrow, flat, blunt septal elevator is now introduced at exactly the same angle and to the same depth as the needle. With the septal elevator accurately in place, it is swept downward through the brain cutting that part of the frontal lobe that lies below the level of the trephine opening. The elevator is now withdrawn.

The hollow needle is first introduced to determine the position of the anterior horn of the lateral ventricle. If the needle enters it and fluid escapes, the needle is withdrawn and reintroduced slightly anteriorly to avoid the ventricle. The septal elevator is now passed in precisely in this plane. Withdrawal of the needle  $1\frac{1}{2}$  cms. after the falx is encountered carries its point clear of the anterior cerebral vessels running into the brain along the midline from the carotid. The septal elevator should not be introduced to a greater depth than that determined by the exploring needle.

The frontal lobe section on the opposite side is now carried out in precisely the same manner. No bleeding should follow the transsection of the brain. The skin wounds are now closed in the usual manner.

Little or no post-operative attention is necessary. The patients are placed in the semi-Fowler position and given 500 cc. of fluid by skin or bowel. They are not restless and sedation is rarely necessary. The two post-operative deaths occurred on the fifth and forty-third days. Autopsy on the first case dying on the fifth day showed no intracranial hemorrhage but an acute yellow atrophy of the liver presumably from the avertin. The second case developed a right hemi-paresis forty-eight hours after operation which changed to a quadriplegic spasticity three days later. She lived about seven weeks with slow but definite improvement in her weakness. She was semi-stuporous and no evaluation of her mental condition was possible. Autopsy showed old hemorrhage and destruction of tissue in both frontal lobes. The elevator had apparently been introduced too deeply on the left side and torn a major branch of the anterior cerebral with bleeding

into the left frontal lobe, the median fissure and across into the substance of the right frontal lobe.

#### SUMMARY

1. Twenty-two psychotic patients have been subjected to frontal lobotomy. Of sixteen agitated depressions twelve recovered sufficiently to live in their own homes, and continue to live at home in a relatively satisfactory degree of emotional adjustment. Of the five advanced schizophrenics two have made apparent recoveries. Two have improved to some degree and one, after making only slight improvement, succumbed to a virulent lobar pneumonia. The case of sexual psychopathy, operated upon as a last resort, made no improvement.

2. Two patients died, one was an anesthetic death and one was the result of post-operative hemorrhage. The mortality rate in general has not been a discouraging feature of frontal lobotomy.

3. The operation should be employed only in chronic psychotic cases and only after

other less drastic therapeutic methods have failed.

4. The constellation of symptoms of fear, anxiety, acute mental suffering, aggressive violence, etc., is a better criterion of anticipated improvement from the operation than the diagnostic label.

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#### DISCUSSION

**DR. M. A. TARUMIANZ** (Farnhurst, Del.).—I am extremely interested in the results which have been obtained in the operation of "prefrontal leucotomy" on selected cases of dementia praecox. Success in this particular psychosis, even if only in particular types, vastly increases the usefulness of the procedure, particularly if cases of long standing can be reclaimed. Dr. Grant has performed this operation on 10 cases at the Delaware State Hospital, almost all cases of agitated depression of prolonged standing. The first operation was done in March, 1938. This patient has taken her former standing in the community and is making an excellent social adjustment after being psychotic for five years. Two of these 10 are now dead. Another case, who had been in the hospital over six years and who showed considerable evidence of "deterioration" is now at home making a satisfactory social adjustment, as well as caring for her household. This woman was mute, paranoid and a difficult feeding problem. However, on rare occasions when she responded, her responses were relevant, this being the only evidence that so called "deterioration" had not occurred.

In most cases where it was possible to obtain psychological readings before and after operation, which were valid, very little improvement was noted. In those cases where marked improvement in response was noted, it was impossible to tell whether functions had actually been reclaimed or

whether the poor results obtained on the first examination were due to interference by the psychotic processes. In practically all cases the ability to reflect and deliberate was interfered with. This was particularly true when the problem presented showed no relation to past experiences. This interference, however, was not great enough to lower the rating.

In cases now living, evidence of agitation has completely disappeared. There seems to be a fatalistic attitude towards the future, patients refusing to be upset by factors in their environments which had caused them considerable difficulty previously. Three cases developed a definite hypomanic attitude after operation, one of which after a period of two years is becoming more stable. Dr. Lyerly of Florida has noted this same reaction at times.

Another of our cases, probably schizophrenic of a catatonic type, entered the hospital as a case of simple depression. However, he soon became mute, obviously hallucinated, untidy, destructive and resistive. Although he showed short periods of mild improvement, he did not maintain these. He showed all evidence of rapid deterioration. So after two years of hospital residence a "prefrontal lobotomy" was done. He showed the usual quick response to the operation, noted by other observers. At the present time, two years after operation, he states that he never felt better in his life. He is inclined to be facetious, but his wife states that this was his tendency before the onset of the psychosis. He

shows little insight into his psychotic state and cannot understand why he was committed. He is inclined to talk and elaborate about himself, whenever the occasion warrants, a tendency which has been noted in other cases. At present he is conducting his business and appears to be normal.

Neurologically no change was noted after operation. The general physical health tended to improve and there was a general gain of weight during the post-operative period. Since most of our cases were in the involutional period, this gain was not, in all cases, considered as a result of the operative procedures.

It is our policy to try all other types of therapy before performing a prefrontal lobotomy. Our results so far make us feel that we are justified in proceeding with a so radical operation, if in spite of all procedures, the condition shows evidence of becoming chronic.

The paper presented today makes it seem justifiable to attempt to reclaim certain cases of dementia praecox who have been psychotic for years. We are certainly not obtaining results in insulin shock or convulsive therapy in these cases and any therapy which would make their life more tolerable would seem to be indicated.

Two of our cases died, one two years after operation from a stroke, which to all appearances had no bearing on the operative procedure, and one from a post-operative hemorrhage. From all reports the operation does not seem to carry with it an excessive danger.

From all evidence obtained, it would seem that the criterion for performing the operation should be the type of symptoms rather than the type of psychosis. The operation seems to give relief to those individuals who are under tension with excessive emotional activity. Possibly the operation is the result of an excessively mechanical age, but in any case if it is successful it is justifiable. Moreover, we cannot close our eyes to the fact that if these chronic cases can be socially reclaimed, even partially, the economic burden is lessened. There are so many chronic schizophrenics, unadjustable psychoneurotics, and chronic manic cases in our hospitals that the problem is of a serious nature. When other radical therapies are of no avail these cases should be carefully studied to determine whether a prefrontal lobotomy is indicated. Age does not seem to be a contraindication, since those of our cases who were in the sixties reacted as well as the younger cases.

DR. WILLIAM P. VAN WAGENEN (Rochester, N. Y.)—I have also been interested in this problem of the treatment of disorders of the emotions by surgical means. Our observations have been made on a somewhat wider group of patients than those described. The observations on the patients with a section of white fibers in the frontal lobe as described by Dr. Strecker and Dr. Grant have been about the same as others. Where the disturbance of emotions falls largely in the fear, awe, rage, anger group the results have been extremely gratifying. Where the disturbance of emotions is

largely one of pleasure and pleasure referable to the autonomic nervous system, the peripheral somatic sensory nervous system, the special senses, etc., the results have been rather disappointing. In the patients with hallucinations and delusions, only two in number to be sure, one has had a very gratifying result and the other is a complete failure. The failure, however, I believe is due to the fact that the white fiber section was not as complete as it should have been.

In addition to the observations on patients with sectioning of white fibers in the frontal lobe, we have had occasion to observe some 30 patients with division of the corpus callosum in part or in whole. I think that it is fair to state that there has been very little change in their emotional state when concomitant pre-existing lesions of the parietal or frontal lobes have not been present. We have seen certain minor changes in the emotions where damage has been present in one hemisphere or the other. This has consisted largely of an emotional flattening, particularly for fear, anxiety, and the states of love as applied to relatives, self and possessions.

Sectioning of the fornix on one or both sides is accompanied by relatively little change in the emotional status that I can make out. The impression is gained that there is a little greater appreciation of the taste of food than previously but this is no more than an impression.

When the connections between the cingular gyrus and the hypothalamus in the frontal lobes are divided in an appropriate fashion the changes in the emotions of fear, awe, rage and anger, are about the same as those previously described. In addition to that, I am under the impression that the senses of pleasure referable to the autonomic system are considerably enhanced. Further work must be done on this point. There is considerable evidence, however, pointing toward the fact that the cingular gyrus is concerned in the recording and appreciation of sensations emanating in the thalamus and hypothalamus.

DR. WALTER FREEMAN (Washington, D. C.)—Dr. Strecker has indeed tackled a tough problem. I doubt whether we would have dared to undertake a similar attack upon this presumably most unfruitful type of institutionalized schizophrenic. Therefore, his accomplishments are all the more to be marvelled at. The question comes up as to just how this has been accomplished. Dr. Strecker presents a number of possible explanations, some of which will appeal to some in the audience, and some to others. We are not entirely satisfied with our own hypotheses. We haven't had a sufficient number of patients intelligent enough to go over their reactions and tell us what they experienced, what the differences are and how they were responsible for the alteration following operation. However, there is a sufficient number of these cases to give us some idea as to what the reason is for this fundamental change in the personality.

We have some anatomic specimens, just as Dr. Grant has, because the patients do not always get

well and stay well; and we have been able, both on the grounds of our own pathological material and on anatomic grounds, to trace out the tracts that have been sectioned by this operation. For one thing, we know that a great many association fibers are sectioned. These come from all parts of the frontal lobe and a good many of them are connected with the opposite frontal lobe by the corpus callosum. These are relatively unimportant. Van Wagenen has shown that the corpus callosum can be sectioned entirely without very much intellectual or emotional change taking place.

Furthermore, there is the fasciculus cinguli that starts in the region of the hypothalamus and runs up around the genu of the corpus callosum, diverging at the splenium to enter the temporal and occipital lobes. Section or interference with this bundle may induce some of the autonomic phenomena which are observed during and after operation, such as vomiting, sweating, and incontinence. We believe the connection between the thalamus and the frontal lobe is the most important of all. It is not a well known connection. Yet it was emphasized by Flechsig in his studies on myelinization, and by all the investigators who have dissected this part of the brain. For instance, if you take a cerebral hemisphere and remove the caudate nucleus with an orange stick or a small blunt spatula, you can see these fibers running out toward the frontal lobe, located in the anterior limb of the internal capsule. This connection with the frontal lobe is definite and rather heavy.

The frontal lobe, as Dr. Strecker has said, is the organizer of the personality, the structure underlying the social sense, the instigator of progress and the determiner of behavior. Dr. Strecker spoke of our own conception of the function of the frontal lobes as being concerned with the function of foresight. However, there is a certain limitation in this, since it is not foresight as regards the concrete but rather in the abstract as related to the ego, the

personality itself. The patients, for instance, after operation, are able to carry out rather complicated intellectual maneuvers. In our series are a young woman who is studying mathematics, a lawyer who is codifying maritime law for the government, a tool designer who patented an invention, and numerous instances of a very effective behavior in carrying on complicated sets of mental operations, looking to the future, constructing images of what can be brought about.

However, it is in the personal life, in the social life, in the interpersonal relations that these defects in foresight show up most clearly. The patients tend to be a little tactless; they are undignified; sometimes they are a bit childish or puerile; they give way to an unrestrained flow of language that is sometimes embarrassing to their families. They are free to a remarkable degree of those feelings of self-consciousness which hold us back from giving our friends a piece of our mind.

We believe, therefore, that the frontal lobe is concerned with the picture that we have of ourselves both as a unit of society and a collection of organs. The thalamic connection mediates the affect attached to that ego image. When the image of the ego gets too painful for the individual so that a psychosis develops and the egocentricity becomes so marked that the patient thinks that people are talking about him or spying on him and otherwise interfering with his adaptation to life, then some whittling down of this ego ideal, let us say, some bleaching of the affect attached to the ego, renders the individual again capable of taking interest in outside things.

Psychosurgery isn't very new. Some of it was done fifty years ago by Burckhardt in Switzerland; but the real impulse to this work came as a result of recent neurophysiologic experiments proving conclusively that both frontal lobes had to be operated upon in order to accomplish this emotional change in personality.

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## THE QUESTION OF VERTEBRAL FRACTURES IN CONVULSIVE THERAPY AND IN EPILEPSY<sup>1</sup>

By HARRY J. WORTHING, M.D., AND LOTHAR B. KALINOWSKY, M.D.

*Brentwood, Long Island*

Convulsive treatment as done with metrazol and as further developed in electric shock therapy received its severest setback when vertebral fractures were found by Stälker(1) and Wespi(2) in single cases and later on by Polatin, Friedman, Harris and Horwitz(3) in 43.1 per cent of all cases treated with metrazol. The high percentage was confirmed by many. The first workers in this field warned against exaggerated conclusions. However, the psychological factor of a "broken back" greatly discredited a method which is of definite therapeutic value, and convulsive treatment was dropped by many psychiatrists and institutions.

A systematic study of all aspects of the problem seems indicated. Principal questions may well be: What are the best means of preventing these fractures? If they occur, will the patient sustain permanent damage and discomfort which will impair his working capacity and joy of living to any extent? Do they occur likewise in electric convulsive treatments? The question of their occurrence in other convulsive conditions like epilepsy and tetanus has also been studied because it was felt that this might lead to a better understanding of the mechanism involved.

We wish to make clear that our purpose was to resolve the inherent questions from a purely clinical standpoint. We shall not go into radiological details. Our purpose is to clarify the problem of the clinical significance of these fractures and their prevention.

Vertebral fractures in metrazol treatment are usually located between the fourth and eighth dorsal vertebrae. They are compression fractures with anterior wedging of the vertebrae. The mechanism does not require detailed discussion here. It is the general opinion, however, that the rigid mid-

dorsal curvature becomes subjected to strong converging muscular forces which act above and below the dorsal region. Most workers in 1939 found these fractures in more than 40 per cent of cases treated with metrazol. Their occurrence has been all the more startling as they are multiple and located in the middorsal spine which is the least mobile section of the spine where the usual traumatic fractures most infrequently occur. The usual localization of traumatic fractures is either between the twelfth dorsal and second lumbar vertebra, or in the lower cervical spine. Only in rare instances and in cases of direct trauma are they seen in the middorsal region. The clinical importance of these unusually located fractures in metrazol treatment should have been doubted from the very first because the method had been applied for several years before any fractures were suspected. The patients have either moderate backache or no complaints at all. Therefore, their actual importance during the time of treatment is not very great.

It still must be determined, however, whether secondary changes may develop subsequently. No report has been given so far with respect to this. Considering the great attention these vertebral fractures received everywhere, this silence might be taken as indicating that sequelæ have not been seen. We decided, however, to study the most severe cases from our own material. Eight patients observed for two years after multiple fractures had occurred were available for reexamination. They were studied from a radiological, orthopedic and neurological point of view. The radiological study showed that there were definitely no progressive pathological changes. Complete healing had occurred. Changes in the sense of Kummel's disease were not noticeable. No kyphosis had developed. Motility of the spine was not limited. Neurological examination did not reveal any involvement of the

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

spinal cord. Special attention was given to radicular pain which might suggest compression of spinal roots. All examinations were negative in this respect as well as in the objective neurological findings.

During the last year electric convulsive therapy was introduced in this country. Usually the first question to come up in discussions of electric shock treatment in our experience is: How does this new method compare with metrazol as to frequency of fractures? Before giving an answer from our own material of electric shock therapy, we must do justice to metrazol treatment. We wish to point out that today fractures in this treatment can be considerably reduced by various means. Bennet(4) was the first to advocate curare for modifying the muscular strength of metrazol convulsions. Later on beta-erythroidin was used for the same purpose. It is, however, important to mention that also without these means metrazol fractures may be reduced considerably. Cheney's(5) recent report on 112 cases showed only two instances of vertebral fractures. This was achieved by having the patient recline on the table with his back hyperextended.

In electric shock treatment the first investigators to use the method without precautions found a few vertebral fractures. It was clear, however, that the percentage was considerably lower than with other methods although no large material was available. Personal communications from several clinics revealed that the frequency of this complication in electric convulsive treatment was less than one-fourth of that in metrazol treatment. One of us (L. B. K.), during the first series of treatments at the New York State Psychiatric Institute, saw about 10 per cent compared with the 43 per cent reported by Polatin, *et al.*, with metrazol and demonstrated by the same radiologist and the same x-ray technician. No compression fracture has been seen in the group of cases which is the object of this study and which was treated in strong hyperextension of the upper part of the spine.

Three large sand bags are placed beneath the patient's middorsal spine. The shoulders and hips are then manually applied to the

table with some force, producing hyperextension to the greatest degree that this relatively rigid section of the spine will permit. A posture resembling opisthotonus results. The purpose of this maneuver is to separate the anterior margins of the vertebral bodies as widely as possible because it is this portion which is especially involved in fractures.

The first 60 cases of electric shock treatment in our hospital were x-rayed routinely before and after a course ranging from 8 to 25 treatments. In no instance were findings resembling compression or other bony change of the vertebrae found. It is possible that fractures will be seen occasionally. Our good results may be attributable to the fact that we arranged to have the same nurses always in charge of handling the patients. Even under less favorable circumstances, however, we do not expect fractures in any number with this method.

Curare was not used in our series with electric shock therapy. Its use has been observed by us in metrazol treatment and the impression was received that a slight embarrassment of respiration was always present. The reason why we consider it more dangerous in electric shock therapy than in metrazol, is that metrazol is a stimulant of the respiratory center. In electric shock therapy, however, a depressive effect on the respiratory center from the treatment itself may be noted. We, therefore, did not dare to add to this central effect a peripheral impairment of the respiratory muscles by means of curare. It may be noted that Harris(6), experienced in curare, recently pointed out that if fractures can be prevented effectively by the use of hyperextension, the general use of curare and similar substances will not only become unnecessary but definitely contraindicated.

It was obvious that even without precautions vertebral fractures in electric shock therapy are rarer than in metrazol. Both are epileptiform attacks. It is, therefore, a question of great interest why fractures in spontaneous epilepsy are relatively an unknown occurrence. This is all the more amazing as fractures in another convulsive condition, tetanus, have been known for a long time. They appear in the majority of

all cases of tetanus reported in this respect. In tetanus during childhood they generally lead to severe kyphotic changes of the spine, unknown in epileptic children. The point of interest is that these fractures in tetanus have exactly the same localization—between the fourth and eighth vertebrae—as those in convulsive therapy.

Do fractures of this kind occur in epilepsy? No reports of fractures of the middorsal region in epilepsy are given in the literature. We, therefore, selected a group of 42 epileptics for radiological examination. In order to get a better comparison, we selected first a group of 20 patients in whom the onset of epilepsy had occurred at the age when convulsive treatment is usually given. The average age of this group of epileptics at the time of their first seizure was 28.2 years. The remainder of our material consists of cases with onset, as is customary, in childhood. The results may be studied together. They are negative in all cases as far as the middorsal region is concerned. In one case, however, we found a definite compression fracture of the first lumbar vertebra. Another patient showed an old fracture of the spinous process of the sixth cervical vertebra. Recently, reports of similar fractures in epilepsy are given by other workers, but no instance of multiple fractures in the middorsal spine has been published.

Zisskind and Somerfeld-Zisskind(7) reported them in the lower dorsal and lumbar regions as in our cases; the same localization was found by Pearson and Ostrum(8) who pointed out that these fractures are quite different from those seen after metrazol therapy. Schatz and Konwaler(9) recently found changes in the cervical spine, mainly spur formation which might be explained as hypertrophic arthritis. The few instances of vertebral fractures reported in epilepsy, have the usual localization of compression fractures of traumatic origin. This is easily understood since in epileptics an occasional trauma from falls can never be excluded. This supposition and the different localization shows that fractures in epilepsy are of quite a different character, nor does it seem that they are caused by muscular contractions during the convolution as is the case in metrazol convulsions. We may add that in

metrazol cases changes in the cervical as well as in the lower dorsal and lumbar regions have been excluded by all workers. We feel that we have sufficient evidence for the conclusion that in epileptic seizures fractures of the same type as in convulsive therapies do not occur.

It is necessary to seek an explanation why fractures in the middorsal region occur so frequently after one or two metrazol seizures, and why they are unknown in epileptics who during their lifetime have a far greater number of convulsions than we ever give during a course of convulsive treatment. Here the fractures usually occur during the very first fit.

Constitutional factors in idiopathic epileptics may be a possible explanation. This would, however, be no explanation in all cases of posttraumatic epilepsy and other types of symptomatic epilepsy. A mechanical explanation is obviously more satisfactory. We must remember that these fractures are found primarily in metrazol convulsions and in tetanus; less frequently in electrically induced convulsions; and not at all in spontaneous epileptic seizures. A study of the motor phenomena of these different types of convulsions provides some explanation. A fully developed generalized seizure always has essentially the same features, the tonic, and subsequent clonic phases. The only difference between artificially produced seizures and spontaneous convulsions is the onset. The onset is abrupt and of a particular type in metrazol convulsions. Strauss, Landis and Hunt(10) described a "first clonic phase" in metrazol convolution, consisting of violent clonic movements. This first clonic phase does not occur in epileptics and the movements are definitely different from those of the second clonic phase of an epileptic. Strauss and co-workers concluded that the central mechanism must be quite different. We believe that these initial movements are the expression of a local stimulation of the motor area whence the stimulus then spreads causing a generalized seizure. This is analogous to stimulation of the exposed brain where the local response may or may not pass over into a generalized seizure. In electric shock therapy we usually have a latent period which slowly progresses

into the tonic phase. Not infrequently, however, we observe a brusque onset when we give a voltage above the convulsive threshold of the individual. This may explain that in electric shock treatment fractures are rarer but do occur. They may be avoided even without preventive measures if the current is kept low enough to produce a latent period invariably before the convulsion. Still another explanation may be that the first strong flexion movement of some patients at the moment when we close the circuit is responsible for the occasional occurrence in electric shock treatment. They also occur rarely in other epileptiform attacks, but we cannot agree with Friedman, Brett and Vogt(11) that these fractures originate during the usual tonic or clonic phases of the epileptic fit. If that were so, they should be just as frequent in spontaneous epilepsy as in convulsive treatment.

It may be repeated that in our opinion a generalized epileptiform seizure is always the same. This we were able to prove by comparing metrazol and electrically-induced convulsions in the same patient. Further, the same was demonstrated by comparing spontaneous and electrically produced seizures in an epileptic patient. They only differ with respect to the onset, *i.e.*, the phenomena before generalization of the seizure.

An abrupt onset similar to that seen after metrazol injection is typical for convulsions during tetanus (Roberg(12), Rand(13)). As Wilson(14) describes it, "On a hypertonic background are projected every now and again extremely powerful spasms. . . ." This possibly explains the great frequency of fractures in exactly the same region as in convulsive treatment. In both instances the patient is suddenly overcome by a strong contraction, an occurrence quite different from the ordinarily gradual onset of an epileptic convolution. This comparison with tetanus is of interest in explaining the difference between the various convulsive conditions with respect particularly to the frequency of vertebral fractures.

#### SUMMARY

1. The considerable percentage of vertebral fractures in the middorsal region during metrazol convulsions can be reduced to a

great extent by appropriate chemical or, better, simple mechanical means.

2. Reexamination of eight patients who had severe multiple fractures two years ago, showed no orthopedic or neurological signs of progressive pathology.

3. In electric shock therapy, even without precautions, these fractures are considerably less frequent. By applying an improved technique of extreme hyperextension, they can be avoided as was shown in 60 cases.

4. Seizures in epilepsy do not produce vertebral fractures in the middorsal region as demonstrated by a series of 42 epileptic patients. Fractures in other regions of the spine occur occasionally but they are of a different type and not comparable to the fractures in convulsive treatment.

5. Vertebral fractures in tetanus have the same localization, about the same frequency and multiplicity as those sustained in metrazol convulsive therapy done without precautions.

6. The varying frequency of vertebral fractures in the various convulsive conditions is explained by differences in the onset of the convulsion.

7. No contraindication against shock treatment can be seen in these fractures which can be largely avoided and which, if they do occur, have no clinical importance.

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## THE SIGNIFICANCE OF VERTEBRAL FRACTURES AS A COMPLICATION OF METRAZOL THERAPY

By NORMAN L. EASTON, M. B.,<sup>1</sup> AND JOSEPH SOMMERS, M. D.<sup>2</sup>

*Toronto, Ontario*

The first case of compression fracture of a vertebra resulting from metrazol therapy was reported in November 1938 by Stalker (14). About the same time Wespi (15) reported a similar case. Meduna, in his early writings, failed to call attention to this complication. Its significance was considered slight until Polatin and his co-workers (12) published an article in April 1939 reporting spinal compression fractures in 43.1 per cent of 51 metrazol-treated patients. This placed

vulsions produced the bone changes seen in the radiographs.

*Age.*—Graves and Pignataro (6) believe that age is a definite contributing factor, claiming that these fractures are more common among the older age groups. This would appear to be a reasonable assumption but it is not borne out by the experience of others. Most workers prefer to treat the younger age groups and the literature contains more reports of compression fracture in cases below forty than over forty years.

*Sex.*—Most authors do not state the incidence of fractures in each sex. Polatin *et al.* found a 30 per cent incidence in males and 51.6 per cent in females. Pearson and Ostrum (11) report a higher incidence in males than in females.

*Calcium Deficiency.*—Such a condition, when it existed, would undoubtedly predispose to fracture. If one were treating patients with a history of feeding deficiency one might expect both calcium and vitamin deficiency. Graves and Pignataro, Pearson and Ostrum, and others state that in chronic psychotic patients the metabolism is frequently disturbed due to the poor dietary habits of many of these patients, thus leading to poor calcification in the bones. Studies of the blood calcium and phosphorus by Hamsa and Bennett (7) appeared to indicate the presence of osteomalacia in advanced stages only.

Pearson and Ostrum, in studying the radiographs of spines of metrazol-treated patients, found no evidence of decalcification or any other abnormal appearance to suggest interference with calcium metabolism by the drug used.

### MECHANISM OF FRACTURE

The actual injury appears to be due to a hyperflexion of the dorsal spine. The vertebrae involved are not the usual ones fractured in the ordinary traumatic injuries, but

TABLE I  
INCIDENCE OF FRACTURES IN METRAZOL-TREATED PATIENTS (REVIEW OF LITERATURE)

| Author                      | Cases | Fractures | Incidence (Per cent) |
|-----------------------------|-------|-----------|----------------------|
| Dedichen .....              | 80    | 6         | 7.5                  |
| Graves and Pignataro.....   | ?     | ?         | 8                    |
| Palmer .....                | 20    | 5         | 25                   |
| Krause and Langsam.....     | 75    | 32        | 42.6                 |
| Polatin <i>et al.</i> ..... | 51    | 22        | 43.1                 |
| Bennett and Fitzpatrick...  | 17    | 8         | 47                   |

the injury in an entirely new light and served to focus attention on it, with the result that reports are now appearing in the literature with increasing frequency.

### REVIEW OF CURRENT LITERATURE

*Incidence.*—A wide diversity of opinion as to the frequency of these fractures is revealed by a study of the current literature. Some writers report an incidence as low as 7.5 per cent and others as high as 47 per cent. Table I provides a brief summary.

In the opinion of the writers, this wide discrepancy is, in part at least, the result of a lack of uniformity in diagnostic criteria, and also of the assumption, without definite proof, that metrazol and the resulting con-

<sup>1</sup> From the Department of Psychiatry, division of research, Toronto Psychiatric Hospital, Dr. C. B. Farrar, Director.

<sup>2</sup> The Department of Radiology, Toronto General Hospital, Dr. G. E. Richards, Director.

are similar to those injured in tetanus, namely, the fourth to the seventh thoracic vertebrae. A number of anatomical facts (Roberg) (13) probably contribute to this end. In the first place, the spinal extensor muscles, developed chiefly to maintain the human body in the erect position, are quite powerful in both cervical and lumbar regions but relatively weak over the mid-dorsal spine. This latter region thus offers least resistance to a contraction of the anterior trunk musculature. The spinal flexor group, and chiefly the powerful abdominal muscles acting through the sternum supported by the muscles of the neck, exert, in contraction, a terrific anterior bowing action due especially to their position of vantage well in front of the spine. The position is comparable to the string on a bow. In convulsions, then, a great anterior pull is exerted on both ends of the spine. Because of the support of the extensors in the cervical and lumbar regions the spine bends acutely in the mid-dorsal region producing compression fractures.

Secondly, the intervertebral discs are thinner in the mid-dorsal spine than elsewhere. This would tend to diminish the normal amount of flexion possible in this region.

In the third place (5), the somewhat more triangular shape of the anterior border of the vertebral bodies in the mid-dorsal region would tend to concentrate more force at one point anteriorly and so cause a greater degree of injury.

Various experiments have been done to determine just what degree of compression the human vertebral body will stand before collapsing. Erlacher (4) and others have found weights of from 200 to 425 kilograms necessary to alter the shape of the adult dorsal and lumbar vertebral bodies. Triphammer blows in rhythmic succession were also applied and found to be more effective in producing collapse. It was found that the elasticity of the bone which would permit a transient flattening at first, later disappeared and the vertebrae became brittle and lost their resistance to sudden pressure and collapsed.

According to Fick (quoted by Roberg) the fifth thoracic vertebra is the weakest in the entire spine. Most reports of fractured vertebrae show the fifth thoracic to be the most frequently involved.

### PRESENT STUDY

In an effort to determine the incidence of such a serious complication, a roentgenological survey was made of the spines of 100 metrazol-treated patients. After reviewing these films we were impressed by the wide variety of bone changes present and were left very much in doubt as to the rôle played by metrazol.

It was then decided to x-ray the complete spine, in both antero-posterior and lateral directions, of all our metrazol-treated patients both before and after treatment. The

TABLE II  
AGE DISTRIBUTION OF CASES TREATED WITH METRAZOL

| Age group  | Male | Female | Total |
|------------|------|--------|-------|
| 18-20..... | 9    | 1      | 10    |
| 21-25..... | 20   | 10     | 30    |
| 26-30..... | 13   | 24     | 37    |
| 31-35..... | 12   | 18     | 30    |
| 36-40..... | 14   | 15     | 29    |
| 41-45..... | 5    | 18     | 23    |
| 46-50..... | 5    | 16     | 21    |
| 51-55..... | 5    | 8      | 13    |
| 56-60..... | 1    | 4      | 5     |
| 61-65..... | 0    | 2      | 2     |

Average: male 32; female 38; total 35.5

present report is based on a careful study of these films taken in 200 consecutive cases.

Of these cases 84 patients (42 per cent) were male and 116 (58 per cent) female. The youngest male was 18 years old and the oldest 56 years, with an average age of 32. The female patients ranged from 19 years to 65 with an average of 38 years. The details are recorded in Table II.

### ANALYSIS OF FRACTURE CASES

*Incidence.*—Forty-six patients sustained fractures of one or more vertebrae showing an incidence of 23 per cent. Twenty-four were males, an incidence of 28.6 per cent, while that in females was 19 per cent (22 cases).

*Age.*—Table III shows the age distribution of these cases of fracture in males and females, the percentage incidence being determined separately within each age group. From these figures it is seen that beyond the age of 55, the incidence of injuries is much greater, as 4 cases out of 7 (57 per cent)

developed fractures as a result of metrazol therapy. This high figure is explained by the relatively poor bone density present in this group of patients.

The age group under 21 shows a fracture incidence of 40 per cent, due, in our opinion, to the fact that the vertebral column has not attained its full adult strength and therefore is less resistant to injury. Thus from this table, it is apparent that the incidence of injury is least between the ages of 21 and 55 inclusive.

TABLE III  
AGE DISTRIBUTION OF FRACTURE CASES

| Age group  | Male cases<br>Per cent | Female cases<br>Per cent | Total cases<br>Per cent |
|------------|------------------------|--------------------------|-------------------------|
| 18-20..... | 4 (44)                 | 0 (0)                    | 4 (40)                  |
| 21-25..... | 5 (25)                 | 1 (10)                   | 6 (20)                  |
| 26-30..... | 4 (30.7)               | 7 (29)                   | 11 (29.7)               |
| 31-35..... | 4 (33.3)               | 2 (11.1)                 | 6 (20)                  |
| 36-40..... | 4 (28.6)               | 3 (20)                   | 7 (24.1)                |
| 41-45..... | 1 (20)                 | 0 (0)                    | 1 (4.3)                 |
| 46-50..... | 2 (40)                 | 4 (25)                   | 6 (28.6)                |
| 51-55..... | 0 (0)                  | 1 (12.5)                 | 1 (7.7)                 |
| 56-60..... | 0 (0)                  | 3 (75)                   | 3 (60)                  |
| 61-65..... | 0 (0)                  | 1 (50)                   | 1 (50)                  |

TABLE IV  
DISTRIBUTION OF FRACTURED VERTEBRAE

|                                 |   |    |    |    |    |   |   |    |
|---------------------------------|---|----|----|----|----|---|---|----|
| Thoracic vertebrae..            | 3 | 4  | 5  | 6  | 7  | 8 | 9 | 10 |
| Number of times fractured ..... | 3 | 25 | 33 | 24 | 17 | 4 | 3 | 2  |

*Fractures.*—Table IV shows the distribution of the fractured vertebrae. In the 46 cases there were 111 vertebrae fractured, or 2.4 per patient. No fractures were found in the cervical or lumbar spines, while those in the thoracic region occurred from the third to the tenth with the greatest number involving the fourth, fifth and sixth, with the peak at the fifth.

It was found that all the fractures were confined to the bodies of the vertebrae, there being no case with demonstrable involvement of the pedicles, laminae or the transverse or spinous processes. The fractures varied in degree from a very mild depression of the superior surface of the body or a very mild anterior projection of the antero-superior lip to a considerable compression of the whole vertebral body. In practically all of the vertebrae, the fracture had developed only in the

superior portion of the body, and only in the most severe cases was there any involvement of the inferior portion. In only two of the 111 injured vertebrae was the inferior surface of the body affected. These findings suggest that the inferior portion of the vertebral body, particularly the inferior surface, is stronger and more resistant to injury than the upper part.

In two cases the fracture was definitely due to the protrusion of the nucleus pulposus of the intervertebral disc through an other-

TABLE V  
INCIDENCE OF NUMBER OF VERTEBRAE FRACTURED

| Number of vertebrae fractured | Incidence          |                      |
|-------------------------------|--------------------|----------------------|
|                               | Male<br>(Per cent) | Female<br>(Per cent) |
| One .....                     | 8.3                | 45.5                 |
| Two .....                     | 33.3               | 22.7                 |
| Three .....                   | 33.3               | 22.7                 |
| Four .....                    | 12.5               | 9.1                  |
| Five .....                    | 12.5               | 0                    |

wise normal superior surface of the vertebral body.

No correlation was found between the site and age, nor the site and sex of the patient, nor was there any found between the number of vertebrae fractured and the age of the patient. The number of bodies injured ranged from one to five, three cases having five vertebrae fractured. These three were males, the eldest being 45 years of age. Nearly one half of the female patients had only one vertebra involved, while this was true of less than 10 per cent of the men. This can be explained by the greater muscular development of the latter and the more violent convulsions produced in the male patients. The details are shown in Table V.

*Pre-Existing Pathological Change.*—All the spines x-rayed were examined to determine the presence of any pre-existing pathological change and to see if any changes found predisposed to an increase in the incidence of fracture. Table VI shows the relationship found between pre-existent lesions and vertebral fractures. From this it is seen that the existence of these conditions did not increase the tendency to injury as far as could be determined from the cases studied. The scoliosis was of a mild nature in most instances, but in 12 this condition was of a

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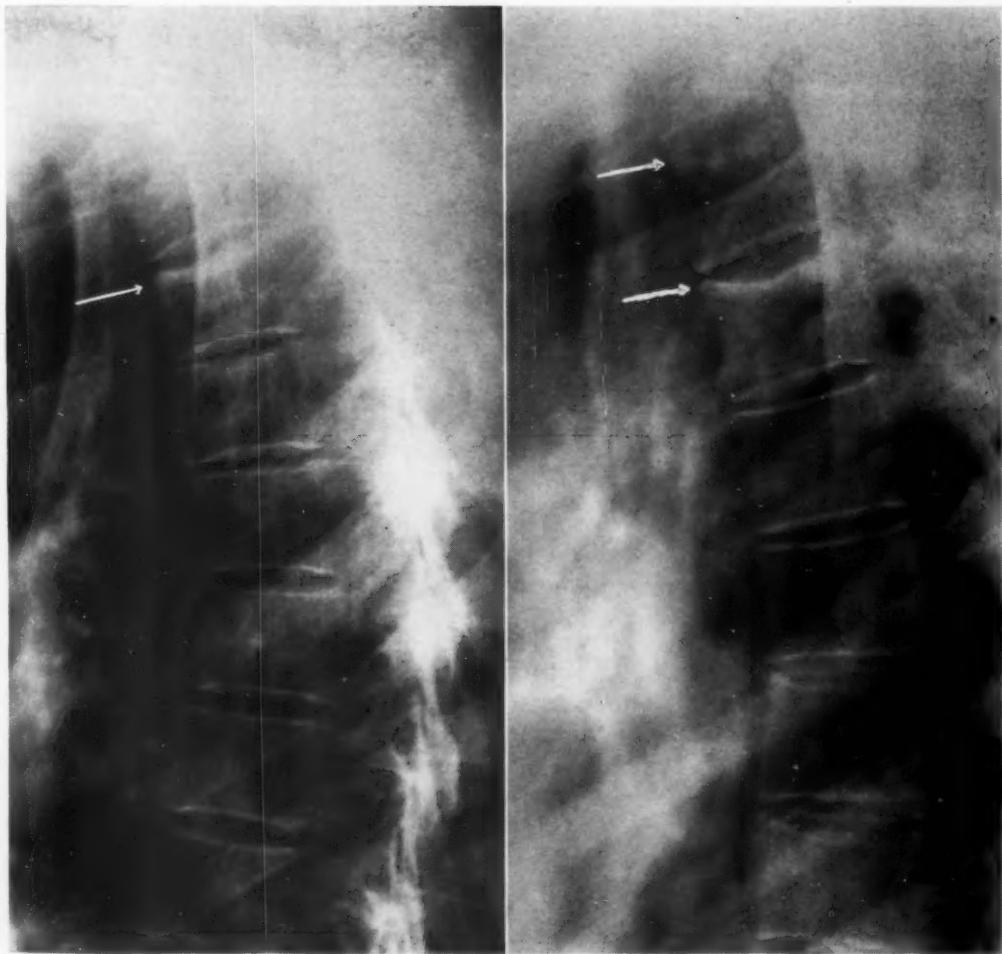


FIG. 1.—Mild fracture superior surface 5th thoracic body.

FIG. 2.—Mild fractures of two thoracic bodies, involvement superior surface.

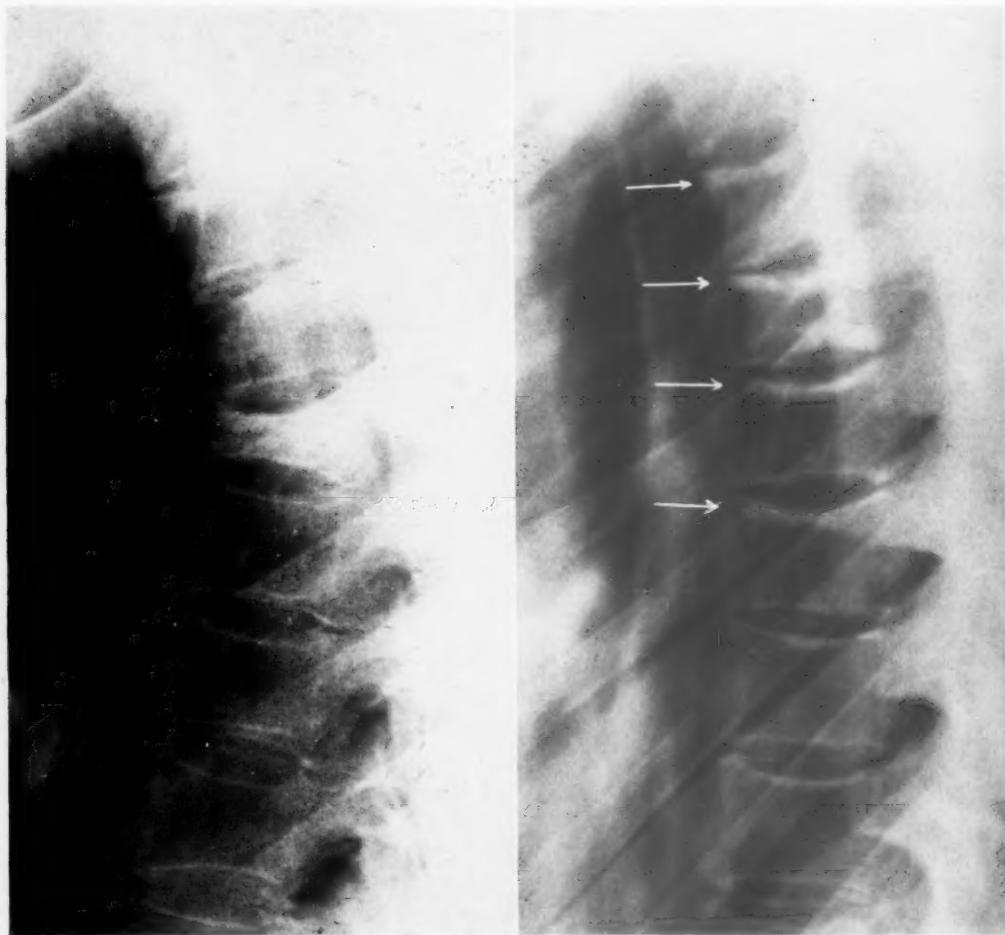


FIG. 3.—Marked compression fracture.

FIG. 4.—Multiple compression fractures of thoracic vertebrae.

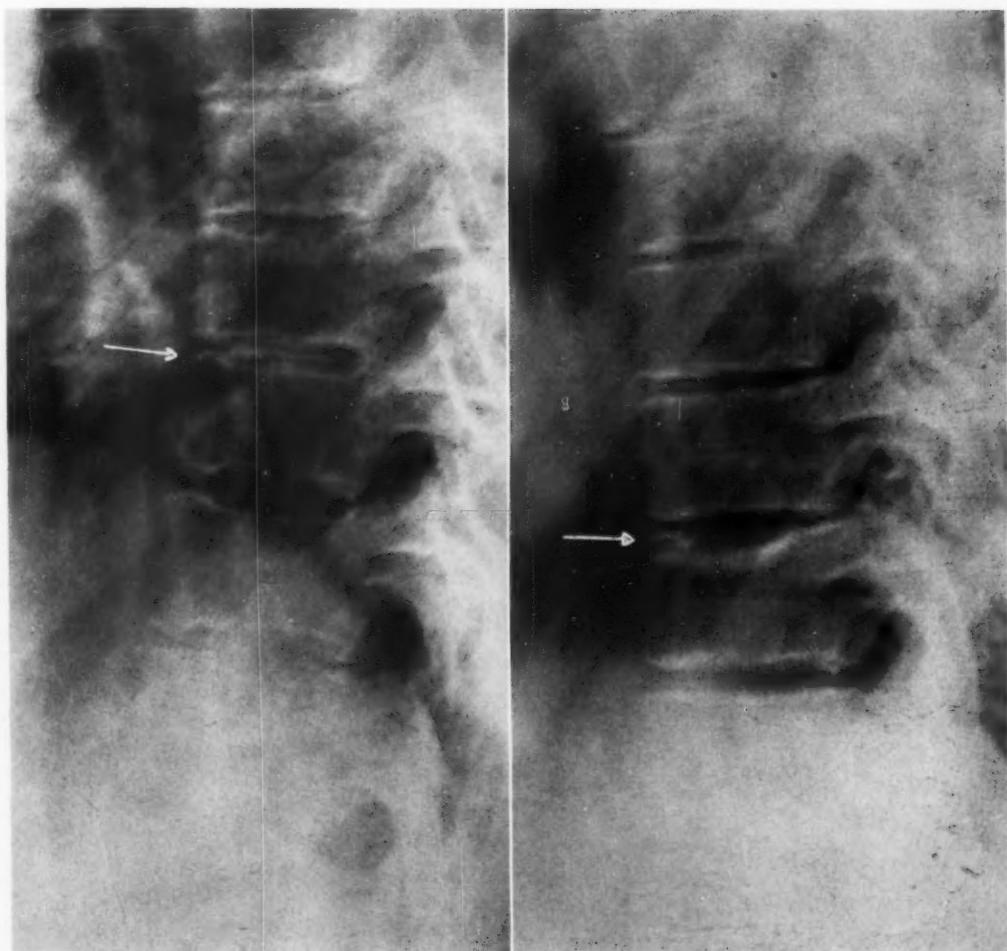


FIG. 5.—Fracture of 10th thoracic body, before and after. Main involvement due to extrusion of nucleus pulposis.

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moderate to fairly marked degree and of these only two (16.7 per cent) showed fractures.

In the table, no mention is made of osteoporosis. No marked cases of this condition were encountered, while lesser degrees of this change could not be accurately determined due to the variation in the quality of the numerous films examined. However, there was a tendency to decreased bone density with increase in age; and as was noted earlier, there was a considerable increase in the incidence of fracture beyond the age of

TABLE VI

RELATIONSHIP BETWEEN PRE-EXISTING PATHOLOGICAL CHANGES OF THE VERTEBRAE AND FRACTURES

|                     | Cases | Fractures | Incidence<br>(Per cent) |
|---------------------|-------|-----------|-------------------------|
| Kyphosis .....      | 19    | 3         | 15.8                    |
| Scoliosis .....     | 52    | 9         | 17.3                    |
| Arthritis .....     | 91    | 21        | 23                      |
| Nuclear change..... | 15    | 4         | 27                      |
| Old Fractures ..... | 3     | 0         | 0                       |

55. Thus it is reasonable to assume that patients with osteoporotic spines would show a greater incidence of fractures.

*Changes Due to Metrazol.*—As there was a possibility, however remote, that metrazol in itself would cause calcium deficiency and thus lead to a weakening of the vertebral bodies, all the pre- and post-treatment films were compared for bone density. No appreciable change was noted. However, as noted before, this study of the radiographs did not constitute a very accurate method. Three patients were then subjected to weekly blood and spinal fluid calcium determinations throughout courses of 9, 11 and 25 metrazol-induced convulsions. In all, approximately 100 determinations were made and at no time did these results vary beyond normal limits.

*Mental Status.*—As several authors had previously suggested a possible correlation between the lengths of the mental illness and the occurrence of fractures, this aspect was carefully considered. No apparent relationship was found between the duration of mental symptoms, nor the type of psychosis, and the incidence of fracture.

Twenty-eight of the 46 positive cases (60.9

per cent) were schizophrenics. The fracture incidence within this group was 25 per cent. Twelve (26 per cent) of the positive cases were diagnosed as manic-depressive psychosis, with a fracture incidence of 21 per cent. Six (13 per cent) patients suffered from involutional melancholia, and the incidence within this group was 23 per cent.

#### SYMPTOMATOLOGY

One feature of these compression fractures was the relatively mild character of the subjective complaint as compared with the degree of pathological change demonstrable in the radiograph. Twenty of the 46 positive cases (43.5 per cent) complained of pain in the back, made worse on movement. In three instances, pain was referred, two to the arm and one to the leg. Six patients showed a definite area of tenderness over the injured vertebrae. Symptoms in all cases cleared up within two weeks. In the great majority of cases spinal injury was not suspected until the x-ray examination of the spine was made

#### TREATMENT

Unquestionably the most important aspect of treatment is prophylactic. Recently, articles have been appearing in all current psychiatric journals suggesting various methods of preventing these compression fractures which appear to be seriously threatening the survival of metrazol therapy.

A more careful selection of patients will no doubt diminish the incidence of this complication. From our results it is seen that the age group beyond 55 presents a definite hazard with this type of therapy while there is also an increased risk in those under 21 years of age.

Mechanical support of the spine during convulsions will diminish the incidence of compression fracture. Treatment is given on a firm mattress. Bed springs are supported by means of two boards, the length of the mattress and one half of its width, which are placed between the springs and mattress. The patient is asked to lie on his back with a sandbag about eight inches in diameter placed beneath the mid-dorsal spine. During the convulsions, firm pressure is exerted on the shoulders and pelvis. This effectively mini-

mizes the amount of anterior flexion of the thoracic spine.

The above procedure is preferable to strapping the patient to a Bradford frame because it does not increase the element of fear as does fixation of the patient before the injection of the metrazol.

Hamsa and Bennett(7) have recommended the administration of a spinal anesthetic of 100 mgms. of procaine hydrochloride one hour before the metrazol injections. This would no doubt diminish or abolish the muscular contractions in the lower body, but the powerful action of the muscles in the upper part of the body would be unaffected. The procedure is time-consuming, however, and would not appear to be without danger of injury if proceeded with often enough.

Bennett has more recently suggested the intravenous injection of curare before giving metrazol in an effort to paralyze the nerve endings in skeletal muscle. One of us (N. L. E.) has limited experience with this method, but so far it has proven very effective. The preparation used is "intocostrin" manufactured by E. R. Squibb and Sons. With it mechanical restraint is not necessary. A new series of cases has been started using this drug as a supplement and the results will be reported later.

The best method of treating the fractures once they do occur is all a matter of surgical judgment. All our cases were seen by consultant surgeons and in only six was any specific therapy recommended. The injury in most instances was relatively slight and associated with no disability. Four cases were put to bed for about two weeks. One was immobilized on a Bradford frame and another in a plaster jacket for 12 weeks. Use of a Bradford frame or plaster spica was recommended only when the vertebral bodies were compressed to half or less of their original height or presented a definite triangular deformity.

Just what the ultimate degree of disability will be remains to be seen. Many of our fracture cases have been out of hospital and gainfully employed for one to two years since the time of injury and none at present makes any complaint referable to the spine. In one case of severe injury a mild kyphos has developed.

#### SUMMARY AND CONCLUSIONS

1. Comparing films of the spine taken before and after treatment in a series of 200 metrazol-treated cases, a fracture incidence of 23 per cent was found.
2. Fractures were found more frequently in males (28.6 per cent) than in females (19 per cent).
3. The incidence of fractures is much greater in patients over 55 years of age and under 21. In the former group, we believe this is due to the relative osteoporosis present in the spine, while the fact that the spines in the young age group have not attained their full adult strength is a contributing factor to the increase in injury in this class.
4. The mental condition present and its duration show no relationship to the incidence of fracture in these patients.
5. Metrazol does not appear to affect the calcium metabolism in the body.
6. In the 46 cases, 111 vertebral bodies were fractured, *i.e.*, 2.4 per patient. No other parts of the vertebrae were involved, and no dislocations occurred. This would explain the absence of spinal cord involvement.
7. All the fractures occurred in the dorsal spine, the fourth, fifth and sixth being the most frequently injured.
8. Multiple fractures occurred more often in males than in females, due, in our opinion, to the greater muscular development of the former and the more powerful convulsions produced in them.
9. In agreement with other published reports, we have found that the symptoms produced are much milder than would be expected from examination of the radiographs of the injured spines.
10. We strongly recommend that routine pre-treatment lateral radiographic examinations of the thoracic spine should be done to determine the presence of any contraindications, and to discover any irregularities in the appearance of the vertebrae which might simulate minor injuries and thus confuse the issue when post-treatment films are examined. All cases should be x-rayed after treatment to diagnose symptomatic and asymptomatic fractures.
11. Kyphosis, scoliosis, arthritis, nuclear change and old fractures are no contra-indication to metrazol therapy. Osteoporosis appears to be a contra-indication.

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## THE HEREDOCONSTITUTIONAL MECHANISMS OF PREDISPOSITION AND RESISTANCE TO SCHIZOPHRENIA<sup>1</sup>

By FRANZ J. KALLMANN, M.D., AND S. EUGENE BARRERA, M.D.

New York, N. Y.

Two major obstacles still interfere with the readiness of psychiatry to build a basically somatogenic concept of schizophrenia from our steadily increasing knowledge of the heredoconstitutional mechanisms which appear to be instrumental in any genuine form of this disorder.

One difficulty lies in the persistent popular belief that the recognition of a fundamentally genetic etiology for this important type of psychosis would minimize the general validity of sociopsychological theories throughout psychiatry and even might result in a fatalistic attitude on the part of patients and physicians. Inheritability is still regarded as incompatible with curability, although rather substantial evidence has been available for years to indicate the fallacy of this biased doctrine. In fact, whenever genetic as well as constitutional mechanisms are known to interact in a morbifying scheme of causation, it would be hard to understand why the accurate identification of all the component elements should not help eventually to simplify the task of systematic treatment. No therapeutic procedure can fail to gain in effectiveness if it is aimed directly and in time at those factors which have been shown to be controllable in the individual.

The other difficulty is more technical and intricate, although no less surmountable. It arises from the need for reliable and complete information about both the actual existence of a primary genetic factor underlying the predisposition to a particular morbid condition, and the possible effects of additional genetic mechanisms determining the constitutional modifiability of that original factor. We cannot be satisfied with the meager conclusion, for instance, that schizo-

phrenia appears to be hereditary, or that the occurrence of a schizophrenic psychosis may be predetermined by the constitution of the individual affected. The proof that such a hereditary basis exists does not terminate a genetic inquiry into the pathogenesis of a given trait, but is merely a beginning that stresses the urgency of more thorough investigations.

The task of evolving a uniform genetic principle for the entire schizophrenic disease group is especially complicated by the marked variability in the clinical expressions of a schizophrenic genotype. This phenotypical modifiability is not surprising, since a restricted and variable expressivity seems to be characteristic of human genetic factors which are relatively common and yet definitely morbifying. It has, however, been responsible for the remarkable fact that the demonstration of a special genetic factor for the varieties of schizophrenic syndromes has proven to be much easier than the description of its modifying mechanisms in precise morphological terms.

To outline this complex principle in the inheritance of schizophrenia in more detail, we may begin with the contention that the predisposition to a schizophrenic psychosis is based on a single genetic factor which is recessive, autosomal and specific, but not fully expressible under all circumstances. The implication would then be that the presence of a particular single-factorial susceptibility is a necessary condition for the specific ability to develop a genuine schizophrenic process.

The assumption of such a specific hereditary factor is substantiated—in our belief, beyond the faintest doubt—by the differential taint figures for schizophrenic families and twin pairs as shown in Fig. 1. These expectancy rates have been obtained from statistically unselected groups of about 400 twin partners and more than 1000 kinships of schizophrenic hospital patients. They

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

From the department of psychiatry of the New York State Psychiatric Institute and Hospital, New York, N. Y.

demonstrate clearly that the chance of developing schizophrenia increases in strict proportion to the degree of consanguinity to a schizophrenic trait-carrier.

The children of one schizophrenic parent have been found by us to have a probability of schizophrenia about nineteen times as high as that of the average population, while the grandchildren as well as the nephews and nieces appear to be still about five times more likely to develop schizophrenia than the average person. The morbidity figure

taint-carriers on non-genetic grounds. The suggestion of a correspondence between similarity in environment and closeness of blood-relationship seems inadequate, especially if we consider that the taint figures for the marriage partners, step-siblings and foster children of schizophrenics are all close to normal, and that the concordance rates of schizophrenia in both types of twins remain practically unchanged regardless of whether the twin pairs were reared together or apart.

Frequency of Schizophrenia and Schizoid Personality in Schizophrenic Kinships  
and Twin Pairs

| Normal<br>Average<br>Population | Children of                    |                                 | Brothers<br>and Sisters |               | Other Blood-Relatives |               |                          | Partners of<br>Schizophrenic Twins |                         |
|---------------------------------|--------------------------------|---------------------------------|-------------------------|---------------|-----------------------|---------------|--------------------------|------------------------------------|-------------------------|
|                                 | One<br>Schizophrenic<br>Parent | Two<br>Schizophrenic<br>Parents | Siblings                | Half-Siblings | Parents               | Grandchildren | Nephews<br>and<br>Nieces | Dizygotic<br>Co-Twins              | Monozygotic<br>Co-Twins |
|                                 |                                |                                 | 11.5                    | 7.8           | 10.3                  | 4.3           | 3.9                      | 12.5                               | 68.3-61.7               |
| Schizophrenia                   | 0.85                           | 16.4                            | 68.1                    | 11.5          | 7.8                   | 10.3          | 4.3                      | 3.9                                | 12.5                    |
| Schizoid<br>Personality         | 2.9                            | 32.6                            | 17.1                    | 10.5          | 7.9                   | 41.7          | 22.8                     | 8.2                                | 14.4                    |
|                                 |                                |                                 |                         |               |                       |               |                          |                                    | 10.5                    |

\* Rosanoff's Concordance Rate for Identical Twin Pairs (41)

\*\* Kallmann's Preliminary Figure (57 Pairs) —

FIG. 1.

for the siblings definitely exceeds that for the half-siblings, but corresponds perfectly with the concordance rate for two-egg twin pairs, whose chance of inheriting a similar genotypical combination is exactly the same as that for any ordinary pair of brothers and sisters.

The highest schizophrenia rates are observed in those categories of consanguinity which must be homozygous for the schizophrenic genotype because of the fact that they necessarily carry the predisposing recessive factor in a duplex state requiring inheritance from both parental sides. This condition of homozygosity is invariably fulfilled by the identical co-twins of schizophrenic twin patients and by the children of two schizophrenic parents. The expectancy figures for these two groups range from about 70 to 80 per cent and thereby preclude any reasonable possibility of explaining the increased susceptibility of schizophrenic

The findings which classify the original factor for schizophrenia as autosomal and specific, are in line with clinical experience and need no particular explanation. Autosomal inheritance excludes linkage to any of the sex-chromosomes and thus implies that the susceptibility to schizophrenia does not differ significantly between the sexes. The specific nature of the schizophrenic genotype is demonstrated by the lack, in all our tainted family members and twin partners, of any marked rise of mental disorders other than those belonging to the schizophrenic disease group, namely, schizophrenic processes and schizoid personalities. Whenever co-twins or other blood-relatives of schizophrenic patients are also found to be psychotic, a schizophrenic type of psychosis may be expected to be the rule, although the onset and clinical form of the disease will vary in a great proportion of these secondary cases.

The assumption of indirect inheritance

requires us to presuppose that the factor for schizophrenia, even though generally recessive, may sometimes be expressed in a merely heterozygous condition, but only to the extent of schizoid personality changes. The implication would be that schizoid types may be either heterozygotes with little resistance to an intermediate expressivity of their single gene or strongly resistant homozygotes with sufficient constitutional strength to counteract the manifestation of their real schizophrenic genotype almost completely (Fig. 2, c and e). Without accepting this

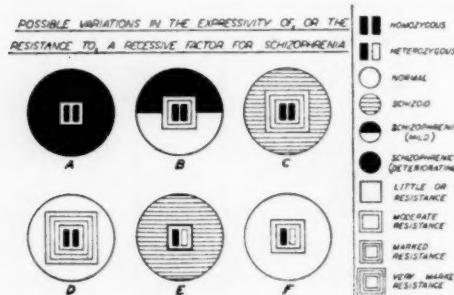


FIG. 2.

theory it would be rather difficult to classify the factor for schizophrenia as recessive and accordingly as expressible only in a duplex state, although the alternative of incomplete dominance would still appear to be more unlikely.

The main evidence in support of recessiveness includes an increased rate in consanguineous marriages for the parents of schizophrenics as well as the consistent observation of that ancestral taint distribution type which is characterized by an excess in secondary cases of the collateral lines over the direct ancestry. The most objectionable feature might be seen in the phenotypical modifiability of the schizophrenic genotype, which actually is so pronounced that it exceeds the usual range for genes in the duplex state and approximates the type of variability characteristic of dominant genes. However, recessive factors do show some variation in expression, and it is not unusual for them not to be expressed at all. Besides, schizophrenia certainly occurs more commonly than is the rule for dominant genes producing a definite abnormality regularly, and its symptomatology is much more severe than

the pathological effects of those relatively common but incompletely dominant genes, whose expression is easily modified in the direction of lessened severity. We are rather inclined, therefore, to give preference to the theory of recessiveness, provided that a satisfactory interpretation can be found for the variable expressivity of the original single factor underlying the susceptibility to the disease.

In trying to work out such an acceptable explanation, we must avoid the usual mistake of misconceiving the restricted or modifiable expressivity of genetically determined anomalies in the sense that the heredity in these cases is considered to be either non-specific or unessential. The inclination to minimize the significance of inheritable morbid factors tending to be variably expressed would be evidently justifiable only if the process responsible for the partial or complete restriction of their clinical manifestation could be sufficiently explained by the effect of non-genetic influences. The suggestion of unspecific inheritance is particularly unsuitable for any trait that is as strongly morbifying as is true for schizophrenia. No allowance is made by such a supposition for the necessity of distinguishing between the basic predispositional factor making for disease and those secondary genetic mechanisms which, by modifying the capacity for resistance, work in the direction of the norm.

To understand the important biological principle revealing itself in the variable resistance to schizophrenic pathology, we must bear in mind that the constitutional ability to reduce, and even to inhibit completely, the severe manifestations of a single-factorial morbid character, can only be explained by the interaction of numerous genetic elements which are harmless and insignificant in their individual, small effects. Modifying genes are normal genes, and always display a continuous range of variations in their joint influence on the trait that is curtailed or suppressed. The degree of resistance achieved will be in reverse proportion to the morbifying effect of the particular specific factor for disease, but it can never be specific or single-factorial itself. Instead, any constitutional mechanism of resistance should be classified genetically as

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a graded character based on multi-factorial inheritance.

The main variations in the interplay between the genetic agents making for susceptibility and resistance to a recessive factor for schizophrenia, are illustrated in Fig. 2 for both homozygosity and heterozygosity. The range of possible variability in a homozygous condition extends from a degree of resistance which is sufficient for the complete inhibition of the specific genotype, through the intermediary states of schizoid personality changes and relatively mild psychotic processes, to the extreme lack of resistance characterized by total disintegration or death. Any deficiencies in the defensive mechanisms of heterozygous individuals can, of course, produce no severer morbifying effects than a variety of schizoid personality types or the schiziform coloring of a non-schizophrenic psychosis manifested by such a heterozygote coincidentally.

In order to assure a conclusive genetic analysis for every variation in schizophrenic trait-carriers, it will evidently be necessary to develop some reliable morphological or biochemical criteria for identifying homozygosity of the schizophrenic genotype in the absence of typical clinical symptoms. In those schizophrenic homozygotes, however, who have had no satisfactory resistance to their specific predisposition, a useful method is available for studying the nature and effect of such a graded character as the one underlying resistance to schizophrenia, that is, the method of biometry.

With this general heredoconstitutional principle in mind, we have attempted in two separate studies to determine possible relations between anthropometric characteristics of schizophrenics and the degree of their resistance to the disintegrating tendency of their schizophrenic psychosis. Our belief in the possibility of this kind of relationship had arisen from the observation of consistent physical similarities and dissimilarities between the two partners of twin pairs in relation to their concordance or discordance for an active schizophrenic process. By tracing the constitutional development of these co-twins from childhood until disease onset photographically and by the aid of carefully obtained histories, we found in the

great majority of twin pairs with only one schizophrenic member that the non-diseased twin had been physically stronger, taller and heavier, and far more resistant to infections and other ailments than the twin who did develop schizophrenia.

For classifying the somatotypes of these twin patients together with a comparable and unselected test group of about 400 male schizophrenics, the recently introduced Sheldon technique was selected. Although the usefulness of this new method has not been established beyond doubt,<sup>2</sup> we tentatively decided upon its use in view of the advantageous principle that every body type is treated as a mixture of three constitutional variables. The various combinations of the pyknic, athletic and asthenic components are regarded as reflections of the three main embryonic tissue layers, and serve as frames of reference on which the different body areas of an individual are rated on a seven-point scale for each component.

The statistical analysis of these anthropometric data reveals a significant trend in the direction of one particular biological principle. When the variations in somatype are related to the degree of schizophrenic deterioration, as is shown in Fig. 3 for the statistical findings obtained in our test group of single-born schizophrenic males, there appears to be a consistent relationship between variability of resistance and the comparative distribution of the athletic and asthenic components of physique. The tendency to extreme deterioration corresponds to the presence of a high asthenic and a low athletic component, while the schizophrenic group with high athletic and low asthenic components shows the relatively strongest resistance, and the pyknic component remains practically unchanged. This tendency is so pronounced that even when

<sup>2</sup> The technical problems of this method as well as the statistical results obtained in the first test groups with the collaboration of Doctors Zubin, Sheldon and Dupertuis will soon be reported elsewhere in detail. Here we should like to state merely, that this study belongs in a research project undertaken upon the initiative of the Director of the New York State Psychiatric Institute, Dr. Nolan D. C. Lewis, and carried on by Dr. Kallmann with the generous financial support of the Carnegie Corporation of New York.

all the possible background factors such as age, weight, height and duration of psychosis are kept constant, the correlation between resistance and the athletic component still persists in the form illustrated graphically in Fig. 4.

the difference always being in favor of the twin who remains free of schizophrenia or deteriorates less. Conversely, whenever twin pairs are concordant as to both the development of a schizophrenic psychosis and the tendency to deterioration, they will be prac-

| Deterioration Groups |                                                 | Description of Material |                       |                               | Means of Possible Background Factors |                  |                  | Means of Constitutional Components |          |          |
|----------------------|-------------------------------------------------|-------------------------|-----------------------|-------------------------------|--------------------------------------|------------------|------------------|------------------------------------|----------|----------|
|                      |                                                 | Number of Cases         | Duration of Psychosis | Prapsyotic Personality Rating | Age in Years                         | Height in Inches | Weight in Pounds | Pyknic                             | Athletic | Asthenic |
|                      |                                                 |                         |                       |                               |                                      |                  |                  |                                    |          |          |
| I                    | Extremely Deteriorated (Little Resistance)      | 123                     | 8.04                  | 66.78                         | 27.84                                | 67.05            | 135.77           | 3.81                               | 2.82     | 4.41     |
| II                   | Considerably Deteriorated (Moderate Resistance) | 150                     | 7.59                  | 66.81                         | 27.84                                | 66.88            | 138.13           | 3.81                               | 3.17     | 4.30     |
| III                  | Slightly Deteriorated (High Resistance)         | 135                     | 6.78                  | 66.62                         | 27.77                                | 67.75            | 144.60           | 3.18                               | 2.78     | 3.92     |

FIG. 3.

#### RELATIONSHIP OF CONSTITUTIONAL COMPONENTS AND DETERIORATION GROUPS

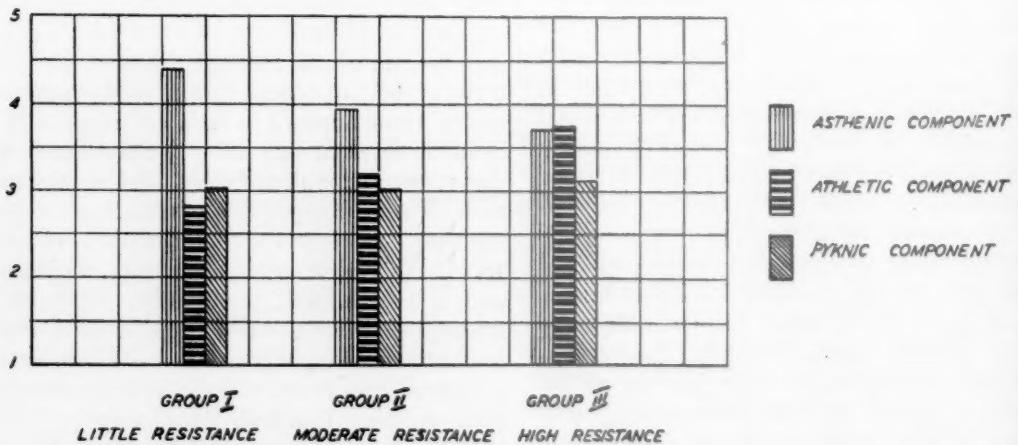


FIG. 4.

The same principle is found to be valid in twin pairs with schizophrenic manifestations in one or both members. If twin partners are discordant as to the morbifying and deteriorating effects of schizophrenia, they tend to be dissimilar in their constitutional strength and somatotype to an extent which never occurs in completely concordant sets,

tically alike in their constitutional types and athletic components, regardless of whether they are monozygotic or dizygotic. It is justifiable to conclude, therefore, that the capacity for a satisfactory resistance to the disintegrating effect of the specific schizophrenic genotype is constitutionally related, probably through the mesodermal elements

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FIG. 5.—The I. twins at the age of 12.

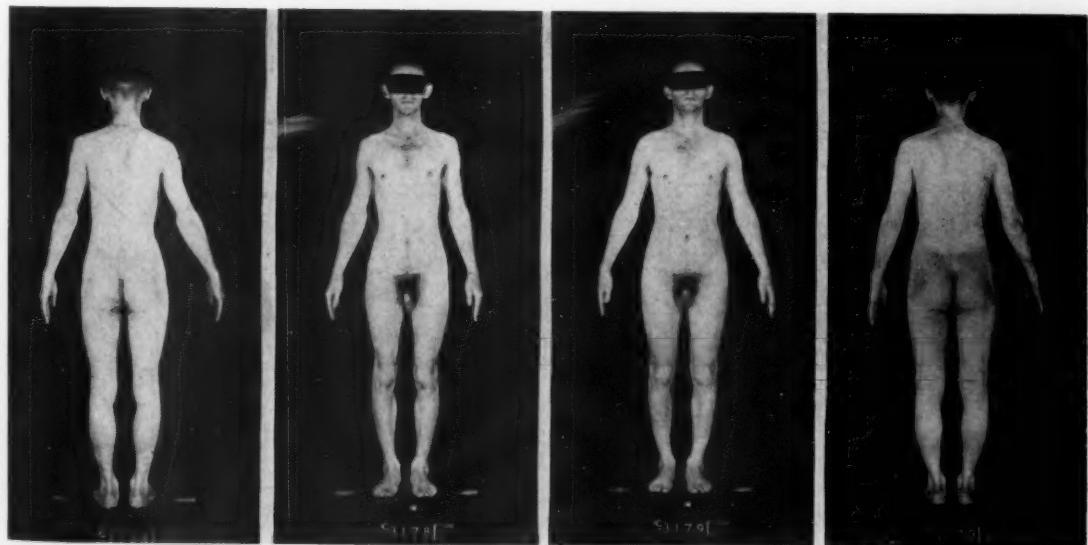


FIG. 6.—The I. twins at the age of 25, seven years after disease onset.



A



B

FIG. 7 (A and B).—The U. twins at the ages of 1½ and 8, respectively, with Lindy on the right.

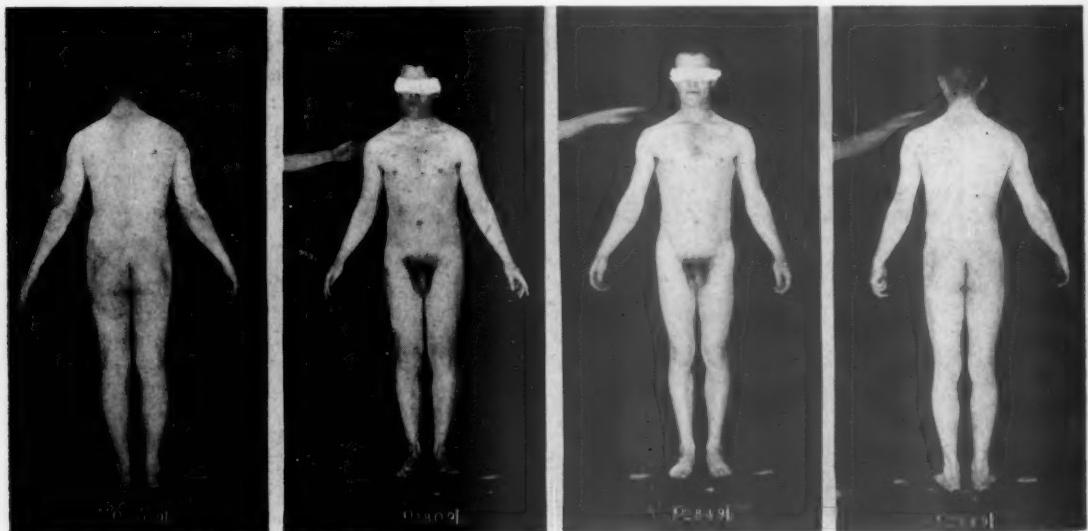


FIG. 8.—The U. twins at the age of 27, with Lindy on the right.

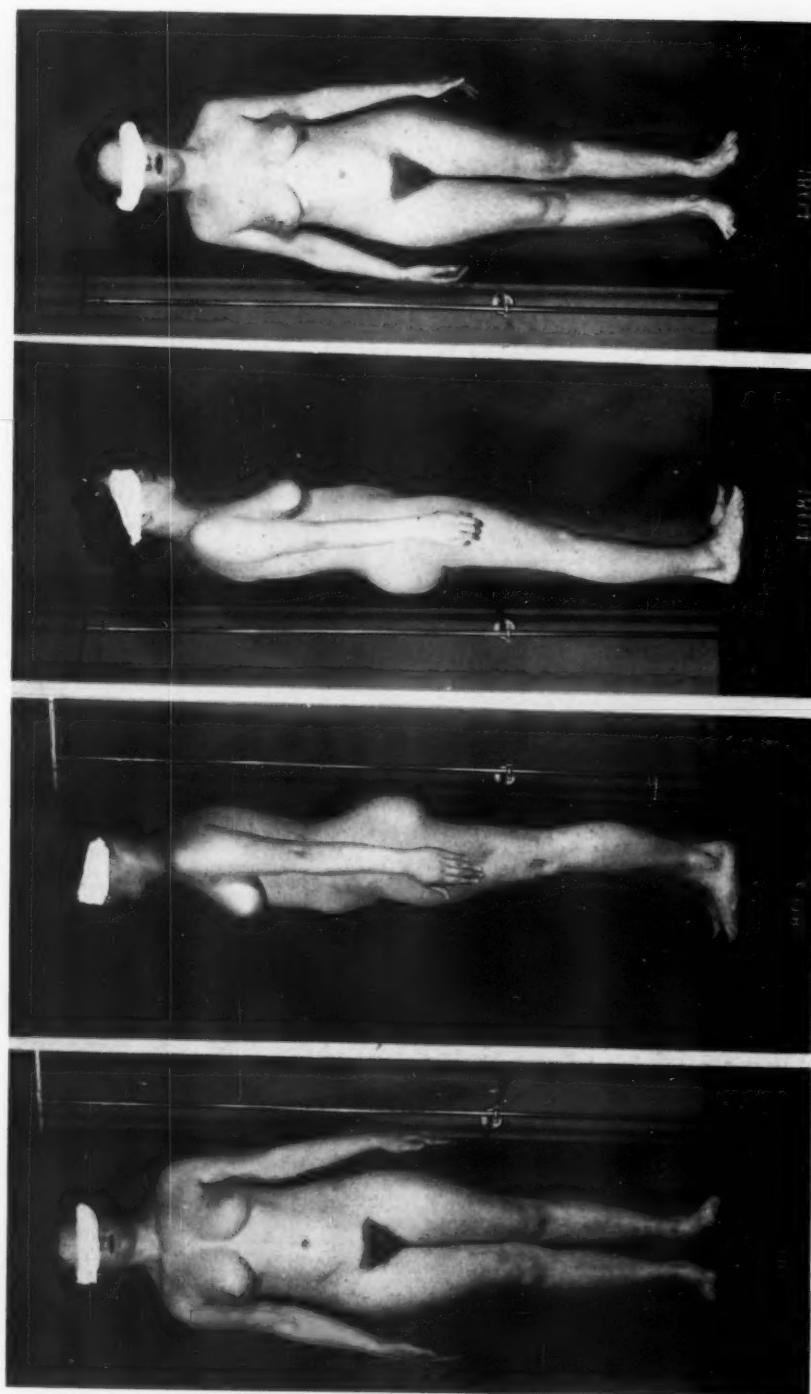


FIG. 9.—The A. twins at the age of 14, with Minnie on the left.

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in a non-specific somatic defense mechanism, to the individual ability to develop a stronger athletic component in compensation for a basic deficiency as indicated by a high asthenic component of physique.

To illustrate the operation of this general constitutional principle in twins as briefly as possible, the presentation of three rather typical pairs may be sufficient.

The first set is a concordant pair of identical twin boys who always looked and behaved so much alike that they were mistaken for each other even by their own parents (Fig. 5). They had the same childhood diseases, were equally susceptible to colds, and distinguished themselves in school by similar mechanical talents and the same disinterest in sports, friendships and the other sex. They were in the same high school grade when in 1932, at the age of 18, they developed very similar schizophrenic manifestations of a predominantly catatonic nature, which in 1933, required the twins' admission on the same day. Since then they have been in the same hospital, deteriorating rapidly to a very low level and never showing any physical or mental differences of note. The anthropometric measurements correspond in almost every detail and give both twins a somatotype of 235, indicating an equally high asthenic component (Fig. 6).

The second pair is likewise identical and concordant, but has shown some interesting differences in anthropometric details, the age at disease onset, and the intensity of a basically similar and equally deteriorating hebephrenic psychosis. Although these twins have never been separated and are monozygotic beyond question, the twin on the right has been consistently behind in weight, height, physical strength and mental stability (Fig. 7). It is this constitutionally weaker twin who developed the earlier and more acute type of psychosis and has been deteriorating a little more rapidly and drastically. There was a difference of three years in the time of onset as well as in the date of admission, and also a minor difference in both twins' negative response to insulin treatment. The respective somatotypes have

been classified independently by several investigators as 334 and 442, revealing the relatively greatest dissimilarity in the asthenic component (Fig. 8).

The third set consists of two dizygotic and discordant twin girls who were both exposed to the same extremely unfavorable childhood experiences. They were only two years old when they were abandoned by their alcoholic and probably psychotic mother. Following their upbringing in various charity homes and their return to the father, a brutal and shiftless drunkard, they were badly mistreated by the step-mother and finally deserted by her also, considered to be equally unmanageable and mentally retarded problem children. At the age of 13, they were both abused by the father and sent again to an institution where, shortly afterwards, an acute and definitely deteriorating schizophrenic psychosis was manifested by the physically inferior and less mature twin on the right (Fig. 9). The other twin, five inches taller and almost thirty pounds heavier at the age of 14, has so far continued to develop normally, practically unaffected by the sexual insult as well as her twin's psychosis. It cannot be said, of course, whether she has been protected from schizophrenia by the lack of a specific susceptibility or by the presence of a particularly strong somatotype, classifiable as 452 as against one of 424 in her psychotic co-twin. It is unquestionable, however, that the discrepancy in the psychological development of these two twin partners corresponds far more adequately to the pronounced differences in their constitutional make-up than to any possible dissimilarities in an unusually unfavorable combination of environmental background factors.

To summarize our present state of information about the genetic factors operating in the pathogenesis of schizophrenia, we may say that the susceptibility to a schizophrenic process depends on a specific type of predisposition which is single-factorial, autosomal and probably recessive, although modifiable in its expression by the effect of mesodermal defense mechanisms. The individual capacity for developing protective and

compensatory reactions to the morbifying tendency of any schizophrenic genotype seems genetically determined as a graded, non-specific character that is multi-factorial and produces a wide range of variations in the vulnerability by, and the constitutional resistance to, the original predispositional factor.

The practical significance of these complex genetic principles should need no particular emphasis. As soon as we shall be able to duplicate or sufficiently reinforce the heredoconstitutional mechanisms responsible for a satisfactory resistance to the disintegrating effects of a schizophrenic process, the therapeutic problem of schizophrenia will be nearer its final solution.

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## HOSPITAL TREATMENT OF PATIENTS WITH PSYCHONEUROTIC DISORDERS<sup>1</sup>

By DONALD M. HAMILTON, M.D., AND JAMES H. WALL, M.D.

*White Plains, N. Y.*

This is the first part of a study of the hospital treatment of patients suffering from psychoneurotic reactions. It is a review of our experience with 100 men representing the total of male psychoneurotic patients admitted consecutively to the New York Hospital, Westchester Division, between the years 1927 and 1937.

The diagnostic grouping was as follows:

|                           |     |
|---------------------------|-----|
| Psychasthenia .....       | 26  |
| Reactive depression ..... | 23  |
| Anxiety state .....       | 22  |
| Mixed type .....          | 14  |
| Hysteria .....            | 7   |
| Hypochondriasis .....     | 6   |
| Neurasthenia .....        | 2   |
|                           | 100 |

Admission to the hospital was by voluntary or voluntary minor application, and the average age was 40, varying from 19 to 79. Most of these men were above average in intelligence and came from superior social and economic environments; 57 had been graduated from college and 28 of these were engaged in professions.

A review of the family histories disclosed mental disorders among the patients' antecedents in 36 instances. Of outstanding etiological importance was a kind of father found in 64 instances. He may be termed a weak individual who set a poor pattern for his son to follow. Many of these fathers were alcoholics, lacked forcefulness, and were described as "too calm and placid, giving in to the mother and the children." They took no part in disciplining their offspring, and in several instances deserted their families when the children were young. Distinguished from the weak fathers, were the mothers of 67 patients. These were aggressive, and

dominated not only the fathers of the families but the patients, whose lives they sought to direct, often forcing their sons into professions against the latters' wishes. This strong feminine influence was accentuated by the presence of feminine siblings in one quarter of the cases. There was much friction in such homes, and the sons often missed the influence of a more vigorous father. In some patients there was evidence of a stunting of aggression from a lack of competition, together with a feeling of guilt about early aggressive attitudes toward such a weak type of father. The identification with the mother was a source of growing resentment and conflict with the onset of adolescence.

These patients came from close-knit, small families; in 20 families the patient was an only child; in 20 other families the patient had only one sibling; three-quarters of all the patients were from families of three or fewer children. In larger families, a predominance of sisters was frequently noted, and the older sisters tended to share the domineering role with the mother.

Prolonged and difficult labors were noted in the birth of only a few patients. However, over half the group had one or more prolonged and severe illnesses before the third year of life. The parents thought these particular patients were weakened by these conditions and the period of invalidism was long. Most of these patients had displayed a tendency toward gastro-intestinal upsets in childhood. They were the center of attention of the anxious family and were overprotected because they were considered "delicate" long after the illness had subsided. Normal physical and personality growth was retarded by these illnesses and unhealthy habit patterns displayed in the adult personality could frequently be traced to such a period. Thus one passive 26-year-old man with mixed psychoneurosis was sickly from birth and suffered from frequent attacks of colitis in addition to the ordinary childhood illnesses. At six he

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Va., May 5-9, 1941.

From the New York Hospital, Westchester Division, and the Department of Psychiatry, Cornell University Medical College, New York.

weighed but 26 pounds and at twelve he was described as being the size of a six-year-old.

Although these patients did not respond to treatment in the hospital as favorably as the group who had not suffered from such prolonged and depleting illnesses, many were discharged much improved. It would seem that patients with many severe childhood illnesses had so much attention fixed on their bodies that some of the anxious concern they displayed later in life could be looked upon as a part of their constitutional makeup. After intensive treatment there was still a residuum of this anxiety left. This has also been noted by many psychiatrists treating patients outside a hospital.

The life histories of the group indicated that their education was in keeping with the opportunities offered by the financial situations of their families. As a group they were overconscientious, self-centered and troubled by feelings of inferiority. There was a tendency to be religious, but in an unhealthy manner, closely associated with sexual conflicts and lacking in broader altruistic qualities. They were finicky about food and generally fussy about their clothes and bodies.

The average age at sexual maturity was 14. Autoerotic practices with marked conflict were of prolonged duration, frequently reaching back into childhood, and were typically present at the time of hospitalization. An interesting inhibition was revealed in many individuals who refrained from using the hands but instead rubbed against the bedclothes. Although only 12 were overtly homosexual, passive tendencies and a feminine approach to life constituted psychological forces of significance in their personality problems as revealed in psychotherapeutic interviews.

Of the 100 men, only 21 were married and had children; 34 others were married and childless; 45 were single. At the time of admission the married men with children had an average age of 42, the married men without children one of 48, and the single men one of 33. One-half the total group had been promiscuous sexually, often with older married women. Venereal disease was uncommon. The sexual abstinence associated with hospitalization was a distinct relief to the majority. Of the 55 married men, 36 gave

a history of marital discord and incompatibility. This was greatly accentuated when the wife was more mature in her psycho-sexual development than her husband. In eight of the 21 men with children, a dynamic factor in their illness was a growing jealousy and rivalry toward the children. Men with children were inclined to worry over the manifestations of sexual development in their offspring. The childless married men feared the increased responsibility of parenthood which they frequently rationalized on the basis of concern over their wives' health; four of this group had their wives aborted. These findings are all indicative of the psychoneurotic's tendency to compromise with accepting a full adult rôle in life.

Unlike the majority of patients who come to a mental hospital with other psychiatric disorders, most men with psychoneurotic reactions have been uncomfortable for many years as a result of their conflicts and symptoms. The exaggeration of symptoms and the incapacity that leads them to seek hospitalization is a gradual process extending over many years, often beginning in infancy. Psycho-neurosis, with symptoms less dramatic than those of most other mental disorders, is often considered among the less severe mental reactions. Our experience does not support this generalization. Most patients had been under medical attention for their various complaints for many years. About half of them had consulted psychiatrists. A study of this pre-hospitalization period of illness reveals certain treatment procedures which can be improved upon. There is the tendency to put too much emphasis on the dramatic cardiac, gastro-intestinal and other somatic manifestations of the neurosis, thus accentuating the physical aspect of the problem in the patient's mind. Such an approach may fix more firmly the patient's neurosis, and his eventual understanding of the psychological aspect of his illness is made more difficult. As physicians we are sometimes too prone to indulge in discussion or soliloquies on differential diagnosis before the neurotic patient. This only adds to the patient's anxieties. Probably because of the pressure of general medical practice, physicians have been known to make remarks placing functional symptoms on the basis of coronary disease.

ulcer or cancer of the gastro-intestinal tract or organic disease of the central nervous system before thorough examinations have been made. Such procedures may have a devastating and far-reaching psychic effect on the patient. It is our experience that an objective approach by the physician who is interested in marshalling the facts concerning his patient as revealed by careful history-taking and a thorough physical examination, including any indicated laboratory tests, is appreciated by the patient and is instrumental in removing many of his underlying anxieties. The psychoneurotic patients in this group were typically skeptical of physicians. They usually had consulted many doctors and all too often had been told that there was "nothing wrong with them."

It was most encouraging to note that there is a great decrease in surgical intervention in such patients, as compared with our histories of former years. However, the tendency remains to treat symptomatically along lines of diet, sedatives, tonics and recommendations of a trip or a change of scene, and to neglect bringing the patient to face his more obvious emotional problem.

Twenty-eight patients suffered from functional symptoms which could be traced to identification with a relative suffering from a serious physical or mental illness or from some outstanding misfortune. The persons involved in the majority of cases were the mother or other female relatives. Acute upper respiratory infections immediately preceded incapacitating neurotic symptoms in five patients. As a rule, the more adequate the precipitating factor, such as death in the family, other great loss or a dramatic frustration, the better was the outcome.

At the time of admission, most patients were underweight. All constitutional types were represented. An asthenic habitus was most common, appearing in one-half the cases. Constitutional factors such as small genitals, atrophied testicles, relaxed inguinal rings, hernia, feminine bodily build or hair distribution or signs of generalized arteriosclerosis were noted in one-half the patients. One-quarter of the group had small genitals or atrophied testicles and a consequent constellation of inferiority attitudes was a dynamic factor in their illnesses.

The outstanding mental symptoms in order of frequency were tenseness, depression, anxiety, sexual preoccupation, hypochondriasis, obsessions and compulsions, fear of insanity and weakness. There was a statistically valid relationship between the symptoms and the outcome. Those patients who had symptoms of anxiety or depression as an outstanding complaint responded most favorably to treatment; 25 per cent more recovered in this group than in the total group, and there were one-half as many failures to respond to treatment. On the other hand, patients with symptoms of weakness, hypochondriasis or fear of insanity as outstanding symptoms revealed a less than average tendency to recover, although the same percentage was benefited by treatment as in the total group. Those patients who suffered from obsessions and compulsions responded least favorably to treatment. There were one-half as many recoveries and twice as many were unimproved by treatment as in the group as a whole.

Modern psychiatry is placing less emphasis on the diagnosis of functional mental illness and more attention on the patient as an individual with his own individual needs and treatment. This change in trend has been appreciated by patients as well as the general medical practitioner and, as a result, more patients are seeking psychiatric hospital care for the so-called "milder" forms of mental disorders. Patients are now more apt to be honest with themselves in recognizing their emotional problems and seeking psychiatric help. More adequate training in psychiatry in the medical schools has resulted in earlier recognition and treatment of mental illness in general. The modern mental hospital has more trained physicians and other personnel, and with the elaborate and varied hospital programs it offers more than a mere place of retreat and rest.

Soon after admission the patients in this group were carefully studied physically. A complete physical examination was made by the patient's personal physician, in addition to examinations by specialists in internal medicine, otolaryngology, ophthalmology, genito-urinary diseases and in dentistry. Complete blood studies and indicated X-rays or other special tests were completed as soon

as possible. The rarely-found physical pathology was treated promptly. Patients were impressed by the thoroughness of their examinations and the physicians' explanations of their findings carried a maximum degree of conviction. As a rule the entire group was placed on a regular diet and they were reassured when they began to gain weight, so that various dietary fads and notions could be easily set aside. They were able to engage in a full program of activities, including occupational therapy, physical education and social activities, from the first. In recent years a music department has been added to the therapeutic facilities of the hospital. In our experience these individuals have a keen appreciation of the artistic, and this form of therapy affords a natural avenue of expression for them. Psychoneurotic patients enjoy singing and make up a good proportion of patients in the choruses, in the casts of operettas or of those taking lessons on various musical instruments.

From the beginning psychotherapeutic interviews proved helpful. Often for the first time since the beginning of his illness, the patient found in his physician one who was willing to listen to his full story. Relief from verbal catharsis, as well as the security obtained from a close patient-physician relationship was of outstanding therapeutic value. Insight into personality conflicts with attendant reduction in anxiety and guilt, and a recognition of assets and liabilities in the individual's personality makeup resulted from frequent interviews with the physician and was a determining factor in the degree of recovery and the stability obtained from treatment. Supervision of the patient's program of activities to fit his individual needs and capacities was considered as no less important than the psychiatric interviews. A careful investigation of the family background, personal history, including personality study, and the present illness was made in each case and was a valuable aid to the physician in his understanding and treatment of the patient.

As soon as the patient was able, he was encouraged to make visits away from the hospital, of gradually increasing duration. This transition period proved to be most valuable in readjustment. Symptoms fre-

quently recurred during this time and gave valuable indication to both physician and patient for modification in his work and family relationships. Some individuals commuted from the hospital to their work. Improvement at this time was frequently rapid. A few patients, particularly those to whom the hospital had become too much of a retreat from facing life's problems, had to be strongly encouraged to make visits away from the hospital.

The routine life in the hospital developed habit patterns of diet, rest, work and social activities which proved distinctly valuable to the patient in his future adjustment. The value of such regular habits was often first impressed upon the patients in the period of their hospitalization and they frequently commented in follow-up contacts that to them this was one of the most valuable contributions made by the hospital. Hobbies developed in the hospital became in a few instances paying vocations after discharge.

The average length of hospital residence for the entire group was eight and a half months. At the time of discharge 42 patients had recovered. They were symptom-free and were able to resume their lives more effectively than before treatment. In the follow-up study we found that three of these patients had had other attacks, but had recovered. One died of a physical disease three years after discharge.

Eleven patients were very much improved at the time of discharge. They were in much better physical condition but had a few annoying residuals of anxiety or other symptoms. They were able to resume their studies or work. In our follow-up we found that five had fully recovered within three years after discharge, thereby making a total of 46 who were recovered at the time of the completion of the study (April, 1941). One of those discharged as very much improved developed a psychosis subsequently.

Eighteen patients were improved at the time of discharge. They were able to be at home in the community but were unable to work and carry on effectively. Our follow-up showed only one change in this group, i.e., one who developed a more serious psychiatric disorder, from which he still suffers.

Twenty-nine patients were unimproved

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from the time they entered the hospital until they left. Our follow-up showed that none of these had improved. One patient died in the hospital of a physical disease. Two committed suicide a year after discharge. Two died of physical disease two years after discharge. One developed a more serious mental disorder.

To summarize: At the present time, at least four years after treatment, 46 psychoneurotic male patients are recovered, 5 very much improved and 17 improved; 68 were definitely helped and have continued to hold their gains.

Some of the above points may best be illustrated by the presentation of illustrative case histories:

The first patient, a single man of 31, was admitted because of anxious fixation of his attention on his body. He came of Jewish stock. His father, a mild man, was a laborer. His mother was a strong domineering woman who ran the family. The patient was the second of six children. His birth was normal. At the age of two years he had a herniotomy, and at three years of age a similar operation was performed on the opposite side. When five years old, he had an abscess of the right foot and on five different occasions during this year this foot was operated upon by a local physician. Each time the patient feared his foot was to be cut off. At the age of six a metatarsal bone of the same foot was removed and during the same year there was a severe infection of the hand. He began school at six and did well up to the age of 12, when at the onset of puberty he became reserved and found the social adjustments of school more difficult. From the time of puberty he turned most of his attention to building up a strong body. Although he became a good boxer, he was mainly interested in this sport as a means of building himself up. He would eat large quantities of vegetables and consume quarts of milk daily. After graduating from high school at 18 he worked irregularly in his father's store. Without much masturbation he began associating with prostitutes and preferred them to perform fellatio upon him. As he progressed in his boxing, he became more afraid of injuries and complained of minor abrasions on his skin.

Three years prior to admission he received a blow on his left ear while boxing. His left ear-drum was ruptured and for three days he cried because he felt he would never be able to appreciate good music. He was not a musician, but for years had been jealous of his older brother who was an excellent musician. Although his hearing was normal to tests, he became more concerned over his body generally and for this reason was advised to come to the hospital.

Physical examination was essentially negative,

including the left ear-drum which had healed. He expressed great concern over his body. He worried about the effect of the slightest noise on his left ear. He complained that his heart was pumping blood too rapidly through his body. He over-ate and complained of nausea and gastric distress. He was in the hospital only two months, allowing no time for adequate treatment, and when last heard from he was anxiously concerned over his body.

This patient shows the effect of early childhood trauma and physical disease in fixing the attention of the individual on his own body.

The second patient, a single man of 31, was admitted on account of mild depression and anxiety of three months' duration following the loss of his position. His father was alcoholic, a poor provider, and later became a farm hand. The mother was indecisive, confided in the patient and leaned upon him for support. The patient was the oldest in a family of two girls and two boys. From an early age, on account of his weak father, he was made to feel that he was the head of the family. He was brilliant and learned easily in school. Although graduating with honors in engineering at 21, he went into business in order to make money more rapidly. He became a bank clerk at a moderate salary. He was secretive about his sex life, and although he had many intimacies with older women, he was afraid of marriage.

Three months prior to admission he lost his position. He continued active physically, but complained of depression and was mildly anxious and hypochondriacal. On admission to the hospital the physical examination was essentially negative. He was able from the beginning to follow a full program of occupational therapy, physical education and social activities. He talked freely with his physician, except that he discussed psychosexual problems reluctantly. He complained of insomnia. Shortly before he left the hospital he revealed that it was his family who had persuaded him to leave engineering and go into business. After this confession he began to be more self-confident. After two months' hospitalization he left very much improved. After leaving the hospital he rested on a farm for a while. His next position was in engineering and for four and a half years he has been very well. About a year ago he was married and in light of his present adjustment he appears to have recovered fully.

This patient illustrates the influence of too much parental domination in the etiology of a psychoneurosis, and how, though the patient was reluctant to discuss his problem fully in a hospital and was not quite well when he left, his later adjustments indicated that he came to grips with his problems while under treatment and later acted upon what he had learned.

The third patient, a married man of 38, came for treatment with a fear that he would die suddenly of heart failure. For two years he had complained of pain in the left side of his chest, palpitation, numbness in his left arm and leg and a fear of sudden death. He had been seen by many physicians who found no physical basis for his complaints. From one to another he passed, receiving words of reassurance, until a week before his admission, when a physician who saw him thought he should come to a mental hospital.

His family history showed a calm, placid father who drank moderately, and who died at 59 after several apoplectic strokes. His mother, a domineering woman, died suddenly of heart disease, six years prior to the patient's admission. He was the youngest of five children. His early development was normal. He was serious and inclined to be religious. His school record was excellent and upon completing high school at 19, he became a salesman.

An inquiry into his psychosexual development showed that he masturbated a great deal during adolescence, with more than usual feelings of guilt. There were also symptoms of heartburn and visceral tensions, which he looked upon as punishments for his sexual indulgences. At 20 he began to have intercourse with prostitutes and at 31 married a woman with whom he had been intimate and upon whom he had had an abortion performed. His marital adjustment was far from happy; he did not wish children and after marriage had other abortions performed. He was able to support children but he feared that they would be too much trouble. During this time he was aware of anxiety, but he worked well. He was 32 when his mother died suddenly of heart disease. Thereupon he became more anxious and religious, began to lose satisfaction in his work and was preoccupied with right and wrong and fear of punishment. Four years later, that is two years prior to admission, after suddenly leaving a position, he complained of anxiety, palpitation, a choking sensation, shifting pain and tension in the upper abdomen and chest, together with numbness of his left extremities.

Then began his round of physicians, in the midst of which he told his story to a young physician who was a close relative. This relative, in his inexperience, informed the patient that he had angina pectoris and that he would "go out like a light." He seized upon this impressive but casual and cruel diagnosis, remained at home as an invalid except for frequent visits to various physicians, and sent his wife out to make the living. He lost weight, became impotent and assumed a nagging, petulant attitude toward his wife when she returned from work. On admission to the hospital he was found to be in good physical condition and all laboratory studies were negative. He walked about, pressing his hands to his chest, complaining of pain and fear of sudden death. He slept and ate well, and when all the physical findings were seen to be negative, he was urged to follow a full schedule of occupational therapy and other hospital activities. To be able to endure

the greatly increased exertions was substantially reassuring to him. At first he resented a psychiatric approach but gradually he reviewed his development as we have presented it. He came to understand the relationship between the symptoms of heartburn and masturbatory conflict and guilt in adolescence. He saw through the sickly impractical nature of his religiosity. He appreciated his fears of assuming adult responsibility and the complicated guilt reaction to having his wife aborted. Of great importance was his understanding of the dynamic influence of his mother's death of heart disease. He had identified himself with her, had become less interested in work, more religious and hypochondriacal, and eventually he had exchanged roles with his wife, who went out to work while he stayed at home for two years. It was with some difficulty that the patient fully reviewed his life and learned better ways of managing, but he fully recovered after fifteen months in the hospital. He has been gainfully employed for seven years.

The patient illustrated several points: namely, the importance of a careful study of the psychosexual development of an individual, the force of identification and the danger of medical terms used too freely before patients.

A fourth patient, a married man of 68, was admitted with the complaints of gastric distress, vomiting and a fear that he had cancer of the stomach.

The father died when the patient was only six and he was reared by a stern, religious and devoted mother. The patient was the third of three children. In his early childhood he reacted to untoward situations with gastric distress and vomiting. In school he did well, but the gastric symptoms continued. He matured at 13 and he masturbated with some conflict. He finished his college work, including his legal education, and entered upon a most successful career as a lawyer. He was married and became the father of two children, to whom he was devoted. His sexual adjustment was satisfactory, but he always had a very sensitive skin and in response to a massage or a scalp rubbing, he would sometimes have an erection with orgasm. Under the strain of work he frequently had gastric symptoms and consulted many physicians and took much medication. He tried many different diets. Thirty years prior to admission he was in one health resort where he was not improving and moved to another place on the advice of a friend. There he thought himself cured by a diet completely different from his previous one. His stomach symptoms, however, continued to bother him.

Two years prior to admission he was casually told by a physician that he had carcinoma of the stomach. He worried and was very fearful. At the time of his admission he was underweight, but a careful physical examination, together with X-ray

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studies, revealed no physical pathology to account for the loss of weight. A few infected teeth were removed. Immediately after completing all physical studies he was placed on a regular diet, and a full program of activities. He gained in weight, and with reassurance and persuasion he gradually added all foods to his diet. He gradually improved and for the first time learned of the influence of emotion on gastric function. He became more tolerant of himself. After four months in the hospital he fully recovered and after four years he is still well and states that he is better than he ever had been before.

#### SUMMARY

1. A study of 100 psychoneurotic men patients admitted to the New York Hospital, Westchester Division, between 1927 and 1937 has been made.

2. Review of the family background revealed that these individuals predominantly came from close-knit, small families, where the father was a weak individual and the mother was aggressive and dominated the home. (Father was weak in 64 cases, mother aggressive and dominating in 67 cases.)

3. An analysis of the life histories revealed a high incidence of serious and prolonged physical illness in infancy and that this was one factor in fixing attention on the body in later life. Such patients responded unfavorably as a group to treatment.

4. The study of the present illness revealed that psychoneuroses tend to be of long duration before hospital treatment is instituted.

5. Identification with relatives suffering from serious physical or mental illness was an etiological factor in the illness of one-fourth of the patients.

6. Outstanding mental symptoms in their order of frequency were tenseness, depression, anxiety, sexual preoccupation, hypochondriasis, obsessions and compulsions, fear of insanity, and weakness. Patients with depression and anxiety as outstanding symptoms responded best to treatment, while fewer recoveries were found in the group displaying hypochondriasis, weakness or fear of insanity, than in the total group. The compulsive and obsessive patients responded least well to treatment.

7. The value of a full and varied program of activities supervised by the physicians and fitted to the patients' needs and capacities, together with frequent psychotherapeutic interviews, was substantiated by this study.

8. The average length of hospitalization was eight and a half months.

9. Follow-up studies of 100 men with psychoneurotic disorders, 4 to 14 years after discharge, revealed that 46 patients were then recovered, 5 much improved, 17 improved, making a total of 68 who had benefited by treatment.

## ELECTROSHOCK TREATMENT IN THE PSYCHOSES<sup>1</sup>

By L. H. SMITH, M.D., J. HUGHES, M.D., D. W. HASTINGS, M.D., AND  
B. J. ALPERS, M.D.

*Philadelphia, Pa.*

### INTRODUCTION

Chemical convulsive therapy, while it produced amazing results in many instances and opened a new vista of psychiatric treatment, had certain disadvantages. These were chiefly the high incidence of fracture and the patient's fear of treatment. A new method of convulsive therapy which would produce the same results and yet eliminate these objections to chemical convulsants would be more satisfactory. The use of convulsions produced by electricity is a step in this direction. If further experience with electroshock bears out these assumptions, this type of treatment may replace chemical convulsants.

### TECHNIQUE

The prospective patient is closely examined from a physical and neurological viewpoint. The following are considered by us to be contraindications to treatment by any convulsive method:

1. Evidence of cerebral lesions.
2. Tuberculosis, active or inactive.
3. Advanced heart disease, regardless of etiology.
4. Bone disease except osteo-arthritis of moderate degree.
5. Malignant tumors, active or "cured."
6. Inanition, especially if coupled with prolonged inactivity or bed confinement.
7. Thrombophlebitis, glaucoma and other conditions which in the opinion of the clinician would make drastic therapy unwise.

In the presence of tuberculosis or malignant growths there seems to be some evidence that convulsive therapy may produce

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

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some reactivation. It may be argued that contraindications are more or less relative because they must be weighed against the prognosis of the mental disease, the efficacy of treatment by other means, and the danger in permitting a patient to continue in a long mental illness. It must always be kept in mind, however, that the treatment itself can be productive of damage.

In addition to the usual routine laboratory work up, laboratory studies are done as follows:

1. Electrocardiogram, to rule out heart disease that might be overlooked clinically.
2. Electroencephalogram, to rule out cerebral lesions that could not be discovered on neurological examination.
3. X-ray of spine, to serve as a control for subsequent studies for fracture and to rule out bone disease.

X-ray has on numerous occasions disclosed a severe osteo-arthritis of the spine which was not suspected clinically.

In such a case we use curare (Intocostrin Squibb) to lessen the degree of convulsion. The spinal X-ray is repeated routinely after the first, and after every fifth treatment. If the patient complains of pain in his bones after any treatment he is X-rayed immediately.

The preparation and technique used is as follows: Treatment is given early in the morning. The patient is dressed in loose fitting night clothes, breakfast is omitted, and if possible, no sedative drug has been used for 12 hours. He lies on a hard mattress placed on a suitable table. A firm pillow or sandbag is placed under the thoracic region of the spine to produce a moderate hyperextension. A gag is placed in the mouth. Assistants exert downward pressure on shoulders, hips and knees. Electrode paste is massaged into both sides of the forehead and the electrodes are applied. (Some workers use a temporo-parietal elec-

trode placement.) For the treatment 60 cycle alternating current is used. The estimated current delivered to the patient ranges from 200-400 milliamperes at 80-175 volts, flowing for 0.1 to 0.6 second, the time depending upon the decision of the physician. The opinion among the various workers as to the amounts of current or the time that should be used varies widely.

When the current flows, the patient becomes immediately unconscious regardless of whether or not he has a convulsion. He will have no memory of a "shock."

With the passage of current the patient gives a generalized jerk which in some cases may be forceful. It is likely that spinal fractures occur at this time, due to the sudden flexion. It is important that the assistants be exerting downward pressure on the shoulders, hips, and knees before the current is delivered. After this initial jerk one of three reactions is observed:

1. A state of brief unconsciousness. The patient is unconscious for a moment but then awakes immediately. After a minute or two another trial is made using a larger current or longer time.

2. A state of more prolonged unconsciousness accompanied by the development of abnormal reflexes. Apnea almost always occurs. This reaction is considered as adequate treatment for the day.

3. Unconsciousness followed by the usual reaction which is a tonic followed by a clonic convulsion. It lasts about 60 seconds.

After the convulsion the patient is unconscious for about 5 minutes and then slowly rouses during the next 5 or 10 minutes. In most instances there is no post-convulsive excited state. If one occurs the patient is given intravenously 3½ grains of sodium amytal (Lilly). Interesting enough the use of this barbiturate just prior to the convulsion does not seem to raise the convulsive threshold. Fifteen to twenty minutes after the treatment the patient is able to walk. He is apt to be quite confused for an hour or two. Close nursing supervision is important during this time.

In the usual case, treatments are given three times weekly. Usually the number of treatments given is from twelve to fourteen. If a patient shows no improvement after

ten treatments, there is little point in continuing therapy because experience has shown further treatment is also ineffective. With a patient showing gradual improvement we have gone on to 35 treatments with good results.

#### COMPLICATIONS

The most common complications are fracture and memory defects.

1. *Fractures.*—In 156 patients treated we have seen the following fractures:

(a) Five cases of compression fracture of a thoracic vertebra (usually fourth to eighth). Two of these were asymptomatic and were discovered by routine X-rays.

(b) Two cases of fractured humerus.

(c) One case of linear fracture of the scapula.

These eight mishaps give a fracture rate of about 5 per cent. Our metrazol fracture rate stood at about 22 per cent.

2. *Memory Defect.*—Almost all patients experience it sometime during treatment and consider it an unpleasant symptom. In some it is prominent, in several it has persisted for several months. We have seen no patients in whom it has been permanent. This loss is a spotty defect usually for proper names, places and dates. The patient for example, often has trouble in recalling the physician's name. The nurses report that a patient may ask the same question a number of times during the day. The relatives make the same comment. Several have reported that the patients seemed to "forget the illness."

One patient was unable to remember many details concerning the preceding year. A professor forgot segments of lectures he had given for years. The memory defect is one into which the patient has good insight and he is usually moderately distressed because it occurs. No one of these memory losses has been permanent.

No neurological sequelæ as a result of electroshock therapy has been seen to date.

Several other complications have been encountered but fortunately are rare:

1. Two patients had an alarming apnoea after the convulsion which required artificial respiration and stimulating drugs. The heart

rate and blood pressure were not materially altered during the apnoeic period. Subsequent attacks apparently were eliminated in these two patients by giving them 3 c.c. of intramuscular metrazol (10 per cent) 5 minutes before electroshock therapy.

2. One patient developed auricular fibrillation, proven by EKG, which lasted for three hours after the convulsion and then disappeared.

3. Dislocations of the jaw are infrequent occurring in 5 instances.

#### TYPES OF CASES AND RESULTS

Electroshock therapy has been used in involutional melancholia, in both phases of manic-depressive psychoses, and in a few cases of schizophrenia and psychoneurosis who had not improved on other treatment. The results in schizophrenia are poor. Only five cases of psychoneuroses have been treated, so we are unable to evaluate the effectiveness of electroshock in these disorders.

The following table shows the results obtained in 108 cases on whom treatment has been concluded for over two months:

| Diagnosis                      | Recovered,<br>per cent | Improved,<br>per cent | Unimproved,<br>per cent | Relapsed,<br>per cent | Total<br>treated |
|--------------------------------|------------------------|-----------------------|-------------------------|-----------------------|------------------|
| Involutorial melancholia ..... | 85                     | 15                    | 0                       | 5                     | 20               |
| Manic-depressive, manic .....  | 70                     | 0                     | 30                      | 0                     | 10               |
| Manic-depressive, depressed .. | 72                     | 10                    | 18                      | 0                     | 49               |
| Schizophrenia .....            | 0                      | 7                     | 93                      | 0                     | 16               |
| Undiagnosed psychosis .....    | 37.5                   | 0                     | 62.5                    | 12.5                  | 8                |
| Psychoneurosis .....           | 60                     | 0                     | 40                      | 0                     | 5                |

By "Recovered" is meant a complete disappearance of symptoms with insight, with the patient being able to return to his former way of life. By "Improved" is meant that the patient is better adjusted to the hospital, but still shows some psychotic signs. In the table above, "Relapsed" cases were those occurring in the "Recovered" group.

#### DISCUSSION

After one year's experience with this new method of therapy, we have come to the following conclusions:

1. Electroshock is better than metrazol because the convulsion tends to be less severe and the fracture rate is 5 per cent (against a fracture rate of 22 per cent with metrazol).

2. Electroshock is also preferable because

the patient has no recollection of, and consequently is not terrified by, the treatment.

3. It is more easily given to a non-cooperative patient in whom a venipuncture would be difficult.

4. Electroshock is simple in application and inexpensive for the patient.

5. The ill effects of treatment in reference to cardiac stress and strain have been found less severe than similar effects with metrazol and insulin therapy, perhaps because of the lack of side effects from drugs.

6. Our series of cases show favorable results in involutional melancholia and in manic-depressive psychoses. The number of cases of other types is not large enough in our series to warrant prediction. However, we must state that the treatment does not look promising for schizophrenia.

7. In spite of the favorable clinical results of electroshock, we cannot recommend a routine or indiscriminate use of this treatment. Neuropathological findings in brains of cats subjected to similar dosage are showing scattered punctate hemorrhages. (A separate report on these findings when completed will be made by Alpers and Hughes.)

Whether these changes occur in the human subject is not known. Because of this it should be stated that this treatment must be reserved (a) for involutional melancolias who have been ill more than a few months and who, by our usual standards, do not seem to be doing well clinically; and (b) for manic-depressive cases of long duration with no improvement or those who previously have had prolonged attacks.

For this reason we feel that the use of electroshock in the early stage of an illness, or for those who are ill for the first time, or for those being treated on an out-patient basis, must be seriously questioned.

The physician must recognize that the price his patient may have to pay for electroshock treatment is punctate hemorrhages in the brain. In advising treatment he must

balance this possibility against the seriousness of the clinical condition.

From the clinical viewpoint the effect of this treatment on a hospital service is very interesting. The length of hospital residence has been materially reduced for nearly all patients under treatment. The agitated and noisy patients are no longer common on the acute wards and the wards are consistently quieter. The morale of the personnel has been improved by the feeling of active service and treatment for such a large percentage of patients. The recovery of the severe, long-standing, agitated depressions makes a profound impression.

There is no reason to believe yet that this attack on some of the psychoses, particularly the manic-depressive conditions, will affect the cycles seen characteristically or reduce the possibility of further attacks. All we should believe is that by electroshock we can change, reduce, or stop an attack. This means, however, that the length of stay in hospitals may be reduced, a hopeful attitude and greater expectancy of results is produced in some cases, and an economic advantage is gained for both patient and hospital. The clinical services handling patients needing prolonged care should be the ones

most benefited, for the disturbed wards are more quiet, and the turnover of patients is more rapid.

The challenge of shock therapy raises many points of importance in both therapy and research. In therapy we must study the effect of subconvulsive doses. In research we must analyze these effects by electroencephalography, estimate the significance of the brain tissue changes, and carry out other experimental studies. The accessibility of the patient during the earlier phases of the illness, the use of psychotherapy in conjunction with the treatment are interesting phases to be investigated.

Our most important problem at the moment is twofold, namely, to find a technique which will reduce the possibility of damage to the central nervous system and to watch by careful follow-up the neurological and psychiatric course followed by patients who have been benefited.

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## RESULTS IN THE USE OF AMPHETAMINE (BENZEDRINE) SULFATE AS AN ADJUVANT IN THE TREATMENT OF CHRONIC ALCOHOLISM<sup>1</sup>

By WILFRED BLOOMBERG, M.D., BOSTON, MASS.

Amphetamine (benzedrine) sulfate has been used by the writer as an adjunct in the treatment of chronic alcoholism since June, 1937—a period of over 3½ years. The effect of the drug in improving the mood, and its favorable action on "hang-over," led to this use. The purpose of the present paper is to report the series of cases, now numbering 56, in which amphetamine has been used, and to attempt an evaluation of its usefulness as an aid in the treatment of this complicated and difficult problem.

### METHOD

It should be first of all clearly noted that amphetamine has never been recommended, nor is it now, as a *cure* for alcoholism. The first 17 cases in the present series, reported in an earlier paper<sup>(1)</sup>, were treated with amphetamine alone, in an attempt to evaluate its usefulness under experimental conditions. The experiment as such, however, lasted for only 9 months. All the later cases, and indeed such of the original 17 as are still under treatment, have been treated by all methods which were available and appropriate to the individual situation. Some of the patients, therefore, have had intensive psychiatric personality reviews, and some have not. A few have been hospitalized for a shorter or longer period during the course of treatment; the great majority have not. Some have been definitely psychotic or psychoneurotic, in addition to being alcoholic; and these have been offered appropriate therapy. The diagnoses have varied through the whole range of mental and physical disorders. In fact the only two features which these pa-

tients all have in common are first that they are all alcoholic, and second, that they have all received benzedrine as an adjunct to whatever other treatment they were given. Benzedrine has cured no one; it has been of considerable assistance in the handling of almost all this series of patients.

The usual technique has been to inaugurate psychotherapy at the earliest opportunity. The patient was, at the first interview, told some of the physician's attitudes and beliefs about the method of dealing with the problem, and it was ascertained that the patient was aware that he had a problem, and was anxious to solve it. If he agreed, a program of interviews was arranged. At the same time, and beginning immediately, benzedrine was prescribed in dosage of 10 mgm. on arising, and 10 mgm. at noon. Patients were seen thereafter, as far as benzedrine was concerned, once a week for several weeks, once in two weeks for several weeks longer, and then once a month or so. Of course if psychiatric or other therapy was to be employed, the visits were arranged on the basis of the necessary therapy.

The dosage of benzedrine was unhesitatingly increased if the patient failed to give evidence of physiological response. It is well known that there is an enormous variation in individual susceptibility to the drug and standardization of dosage is therefore difficult, if not impossible. The patients in this series all received adequate amounts of benzedrine, estimated usually by careful questioning as to its effect on mood, on night sleep, and on general "jitteriness." The most satisfactory method of finding the correct dosage was to continue to increase it until there was some interference with night sleep, and onset of hyperirritability, then to omit the drug for one day, resume at a slightly lower dosage level and continue there. Many patients take 40 to 50 mgm. daily, and one has taken as much as 140 mgm. I believe that inadequate dosage is responsible for

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

From the department of neurology, Harvard Medical School, and the neurological unit, Boston City Hospital, Boston, Mass.

This study has been assisted by a grant from the Smith, Kline and French Co.

many failures to secure effective results with benzedrine, both in alcoholism and in other conditions for which it is indicated. That such dosage is safe appears evident not only from the experience with these patients, but from the fact that careful and complete clinical and laboratory study of three narcoleptics after daily doses of over 80 mgm. for over 2½ years showed no deleterious physical or mental effects(2); nor has there been any evidence of addiction or habit formation in any of these patients.

### RESULTS

Statistical approach to this series is difficult, since, as has been noted, there is little uniformity of diagnosis or method of treatment other than amphetamine. The series is small, so that percentages are meaningless. The only control must lie in the experience of numerous physicians who have treated alcoholics by many different methods. Nevertheless, Table I gives the results of treat-

TABLE I

|                                                               | Cases  |          |
|---------------------------------------------------------------|--------|----------|
|                                                               | Active | Inactive |
| Total number .....                                            | 23     | 33       |
| Total abstinence .....                                        | 10     | 12       |
| Significant modification of drinking habits .....             | 23     | 26       |
| Free period at least six times longer than pre-treatment..... | 20     | 21       |
| Relapse; generally good result...                             | 8      | 7        |
| Relapse; generally poor result...                             | 5      | 6        |
| Total failure .....                                           | 0      | 8        |

ment in these 56 cases. Those cases listed as "active" are those who are still under treatment, or for whom a report, through patient or family, is available within the last few weeks. The inactive cases are those for whom no report has been available for some time. However, in many of this group, the patients were followed for a year or more. Results are as of the date of last report. It is of interest that the proportion of total abstainers and of generally successful results is about the same in the two groups.

It has been considered if a patient who has been drinking heavily and almost daily for years; who has lost his job and perhaps his family, has succeeded under treatment

in limiting his drinking to one episode every 6 or 8 months, that the result of treatment is generally favorable. Total abstinence is, of course, the ideal to be aimed at, but if a patient goes back to work and carries out his work successfully, and reestablishes his place in the family, something has been accomplished which is worth noting. Therefore, in the accompanying report, it has been noted how many patients have undergone a significant modification in drinking habits. Also, there has been set up the arbitrary measurement of noting when a patient's period of abstinence has been at least six times as long as his longest free period in the year preceding the initiation of treatment. If this free period has been only two days, then two weeks is not a very significant improvement. If, however, drinking has previously occurred in bouts coming every six weeks, then a free period of a year or more is important, at least to the economic and domestic welfare of the patient.

Because the statistical method is inadequate, a few brief summaries of cases are here presented. These are chosen as typical of the various classifications in Table I.

#### CASE I.—Inactive—total failure.

A 63-year-old manufacturer, drinking for 40 years, in the past four years averaging 10-16 ounces of whiskey daily. On January 4, 1938, started on benzedrine. Only further report by telephone, two weeks later, when he said the medicine had been of some help, but he had not stopped drinking entirely. He has not returned for further treatment.

#### CASE II.—Active—total abstinence—without psychotherapy.

A 47-year-old insurance broker. Had been drinking heavily since age 19, especially in the past 8 years; bouts lasting a week, coming at intervals not longer than 3 weeks. Drinking partly a result of depressive mood swings; business not doing well; domestic situation tangled; upset because practically financially dependent upon wife's aunt.

Treatment started September 22, 1937, with 20 mgm. of benzedrine sulfate daily, gradually increased to 50 mgm. daily. At date of last report, January, 1941, had remained totally abstinent, and from the very beginning of treatment lost all desire for liquor. This patient had little or no psychiatric treatment. He continued to take benzedrine for about two years, then spontaneously discontinued it, taking an occasional tablet only if depressed or over-tired.

#### CASE III.—Active—total abstinence—with psychotherapy—probable psychosis.

A 46-year-old woman secretary, drinking for 20

years, heavily in the last five years. During this time she averaged 1½ pints daily. Her longest free period in preceding year, one week. First seen on March 13, 1940, but no treatment until June 18, 1940. Since then one day of drinking in August, 1940, and no other liquor to date of last visit, April 3, 1941. Has been taking 40-160 mgm. of benzedrine daily. She is now, however, showing ideas of influence and rare hallucinations, strongly suggestive of schizophrenia; with a history of similar ideas and hallucinations many years ago.

**CASE IV.—Active—total abstinence—with psychotherapy—personality disorder.**

A 48-year-old man in the field of public administration research. A mild diabetic. Drinking for 15 years; in preceding three years, heavy drinking in bouts of 2-3 days coming every 1-3 weeks; longest free period in preceding year two weeks.

Peculiar personality, evasive, with feelings of inadequacy and inferiority and prone to find excuses.

First seen February 10, 1939. A vacation from his trying work was ordered, and on his return an intensive personality review undertaken, with apparent success. Last report about January 1, 1941; he told of new job in defense program, apparently well adjusted. Had no liquor since beginning treatment.

**CASE V.—Active—relapse with generally good results—psychopathic personality—no other therapy.**

A 47-year-old manufacturer, a very heavy drinker for 12 years; in the past 2-3 years, averaged 16 gins daily; longest free period in several years 6 days, except for intervals spent in mental hospitals. Known to most of the private mental hospitals and psychiatrists of Massachusetts. Apparently the unstable, inadequate off-spring of a wealthy, able family. Wife an alcoholic and barbiturate addict; his children have been a disappointment in their collegiate and domestic careers.

Benzedrine, 20-40 mgm. daily, started on June 29, 1937. Without alcohol entirely until January or February, 1938, then some beer and a highball while on a cruise. This "social drinking," stopped on his return, until April 1, 1938 when he had a 6-day drinking episode. Since that time and to his most recent report in March, 1941, he has continued to take benzedrine. Occasional interviews, but no organized psychotherapy. Assisted over two episodes when his wife needed attention, during one of which she had to be sent to a mental hospital. During this time a drinking bout lasting 1-3 weeks about every 6 months. Between attacks, totally abstinent; he is back at work.

**CASE VI.—Active—relapse with generally good result—no psychotherapy.**

A 65-year-old retired businessman used alcohol for many years, but excessively in the past 5 years; 5-6 cocktails daily, with heavier exacerbations every two weeks.

First seen January 31, 1938, and given 20 mgm. of benzedrine sulfate daily. Had no liquor and "no desire for any" until the hurricane of September, 1938, when some of his cherished old trees were lost.

Drank heavily for 2-3 days, then stopped. At last report, January, 1941, an occasional drinking bout lasting a day or two, every 4-6 months. Daily drinking stopped. Takes benzedrine now only occasionally.

**CASE VII.—Active—relapse with generally poor result—attempted psychotherapy—probable paranoid condition.**

A 44-year-old lawyer, whose heavy drinking had lasted eight years. Extremely brilliant and successful, but lost practise and standing completely since alcoholism had begun. Separated from his wife; sexual maladjustment, and definite paranoid trends, more marked when drinking.

On March 28, 1939, benzedrine started. Attempt to treat mental disorder; extremely resistant and no progress made. Remained total abstainer until August, 1939, then an episode of drinking which required hospitalization for one week. He started benzedrine again and did not drink again until March, 1940.

Has reestablished practise with fair success. However, there have been continuing episodes of elation, over-activity, over-work, increasing tension and drinking, occurring at intervals of 2-6 months.

**CASE VIII.—Active—relapse with generally poor result—inferior personality.**

A 43-year-old unemployed man, drinking 1 quart of whiskey daily for 10 years; only free interval had been 4 months, while sentenced to State Farm for chronic alcoholism.

Inferior intellectually and in personality, though his brothers were extremely competent and able business-men. On February 7, 1939, benzedrine was given. In spite of sudden death of wife, during the interval, no drinking until December 15, 1939. From this time on, however, drinking gradually increased until in March, 1940, sent for treatment to private mental hospital, until January, 1941. Since discharge getting along well, working and not drinking at time of last report in March, 1941.

**CASE IX.—Active—relapse with generally poor result—psychopathic personality; reactive depression—with psychotherapy.**

A 41-year-old housewife and former nurse, "cured" of drug addiction many years before. Recently, drinking heavily following sudden death of husband. A diagnosis of psychopathic personality seemed justified. Started treatment February 19, 1940. Was in a reactive depression. Drinking modified but not stopped for several months. Then stopped drinking and got along well until November, 1940, when she became addicted to paraldehyde. In January, 1941, a mental collapse and transfer to a state hospital.

**CASE X.—Inactive—total abstinence—anxiety state, depression.**

A 65-year-old plumbing contractor, drinking daily for one year, following business reverses and domestic difficulties. He was first seen on May 5, 1939, found to be obese; his blood pressure 240/100; diagnosis of anxiety state, and possible depression.

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Given small doses of benzedrine. On May 31, 1939, reported general health better and had lost weight. He had not been drinking. Systolic blood pressure was down to 150.

Daughter reported on August 1, 1939, that he had had no alcohol since his first visit; feeling well and happy and was working.

**CASE XI.—Inactive—relapse with generally good results.**

A 53-year-old housewife, drinking heavily for 10 years; longest free interval in past year had been 3 days. Some symptoms of the menopause. Her husband, she felt, was not sufficiently sympathetic.

On September 23, 1937, benzedrine 20 mgm. daily started. Did not stop drinking until October 15, 1937, then taking 40 mgm. daily. In November, 1937, had a glass of ale on two social occasions, and in December, 1937, an 8-day beer-drinking episode. In April, 1938, she drank for about 10 days and then again later in the summer of 1938. Last report from her husband, in the Spring of 1940, was that she was greatly improved, drinking only very rarely and very little, abstaining entirely between episodes.

**CASE XII.—Inactive—relapse with generally poor results—paranoid schizophrenia (?).**

A 33-year-old mechanical engineer, drinking heavily for 5 years, averaging a quart a day; longest free interval in the past year 1 week. Marital and sexual maladjustment. First seen on November 2, 1938, diagnosis of psychopathic personality. Benzedrine treatment started but he refused psychiatric review. No liquor until April, 1938, when he ran out of benzedrine, failed to renew his supply and in about 10 days began to drink. Started benzedrine again after this episode was over. When seen at last visit in November, 1939, had lost his job, was discouraged and depressed. Had been drinking at intervals, though less heavily than before. At time of last interview a diagnosis of paranoid schizophrenia appeared justified.

#### COMMENT

Benzedrine has proved useful in the handling of this series of cases in several different ways. First of all, it combats very effectively the depression and general malaise of acute "hang-over" and continues to combat these symptoms throughout the period of several weeks of readjustment following total withdrawal of alcohol. This period is well understood by any alcoholic; it is as if the ordinary acute hang-over were prolonged day after day for weeks. Most alcoholics know that the best treatment for hang-over is another drink and it is this feeling which makes alcoholics wish to taper off rather than to stop drinking completely and abruptly. Benzedrine is as effective as alcohol in overcoming this depression and jitteriness, and it becomes pos-

sible thus for the patient to stop drinking and be completely detoxified in a comparatively short time, without great discomfort.

The second advantage grows out of the first—it is possible to carry out this whole program without hospitalization. Frequently, because of the withdrawal effects, it is necessary to enforce abstinence by institutionalizing the patient. Benzedrine makes this unnecessary in the overwhelming majority of cases. This more or less physiological and pharmacological fact has an enormous psychological value, since it appears evident that a week of voluntary abstinence is better than six months of enforced and involuntary teetotalism.

Thirdly, patients are frequently either hopeless about the situation or somewhat hostile, or both. The fact that benzedrine gives an immediately perceptible effect and helps the process in the first few days makes rapport between patient and physician much easier to attain. Something tangible and specific has been done for the patient; and he is much more willing to try to cure himself by "talking" if he feels that the immediate unpleasant symptoms are receiving attention. Almost invariably, with any will to stop drinking, this can be achieved under benzedrine for a short period at least; even those patients who relapse have some time of total abstinence; and this makes the patient willing to come back to the physician and relieves him of the shame and guilt of having to return for his second appointment and admit that he has already "fallen off the wagon."

The fourth mode of helpfulness grows out of the fact that alcoholics are accustomed to solving all their difficulties by ingesting something, and achieving an effect by external stimulus, usually alcohol. It appears reasonable to them, therefore, that something they ingest should help them. Benzedrine is substituted for alcohol in the habit pattern; yet the effect is good rather than bad and they are pleased, and the internal logic of the situation for them is satisfied.

In the fifth place, in terms of the longer pull, after the first few weeks benzedrine tends to smooth out mood swings and to give the patient a "lift" on his bad days, of the kind he had always hoped to get from alcohol but never did. He feels, while he is taking

benzedrine, energetic, ambitious, able to work again—something he usually has not been able to do efficiently for some time. Instead of spending months in a hospital, out of circulation, away from his family, which is disintegrating, and his job, which is dropping out from under him, he finds his wife enthusiastic about his progress, his friends pleased and warm, and his work going better than it has perhaps for years. All this is of the greatest value in inducing him to go on with treatment, and to continue to make the effort not to drink. Frequently these patients say they "have no more craving for liquor." What they probably mean is that they are, with benzedrine, well enough able to face the reality of their life situations, not to need alcohol.

In handling this series of cases, benzedrine has been extremely useful as an aid to whatever other therapy could be administered. That its use has value would appear to be evident in view of the results. A certain

small number of cases have responded, in the early experimental situation, extremely well to benzedrine without any other therapy. However, in the whole series, the degree of modification of drinking habits, the number of total abstainers and the number of generally good results, would appear to be greater than is the usual expectation in the psychiatric handling of alcoholics. Obviously, the problem is complex; there is no uniformity of etiology and of diagnosis, and certainly no one magic method is the answer to the problem of treatment. It would appear that the present results warrant the conclusion that benzedrine is, however, a useful adjunct to any method of treatment.

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## THE MENSTRUAL CYCLE WITH VAGINAL SMEAR STUDIES IN SCHIZOPHRENIA, DEPRESSION AND ELATION<sup>1</sup>

BY HERBERT S. RIPLEY, M. D., AND GEORGE N. PAPANICOLAOU, M. D., PH. D.

*New York City*

Since ancient times there has been an appreciation of the fact that menstrual irregularities occur in association with emotional disturbances. An early and widely accepted theory postulated that the suppression of menstruation with resultant retention of blood in the body caused mental disease. The fallacy of this theory was recognized by later investigators who concluded that disorders of menstruation merely signified an accompanying somatic involvement. The frequency of menstrual disturbances, and more particularly the absence of menses in psychoses, have been stressed by numerous workers including Schröter(1), Haymann(2), Jolly(3), and Hanse(4). The highest figures obtained for the incidence of amenorrhea are those of Hanse who found it to be present as follows: catatonia 62.5 per cent, hebephrenia and paranoia 50.0 per cent, melancholia 60.0 per cent, and mania 45.0 per cent. Allen and Henry(5) studied menstruation in mental illnesses and concluded that there are menstrual reactions which are characteristic of different mental disorders.

In the present investigation the menstrual interval and the amount and duration of bleeding were observed in 221 patients, including 114 with a diagnosis of schizophrenia having 436 menstrual cycles, 81 with depression having 286 cycles, and 26 with elation having 95 cycles. All of the patients were under observation in the Payne Whitney Psychiatric Clinic In-Patient Department over a period varying from 2 to 22 months. The age range was from 13 to 40. Only two

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

From The New York Hospital and the Departments of Anatomy and Psychiatry, Cornell University Medical College, New York.

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patients were below 16 years of age. Forty was chosen as the upper age limit so as to minimize the possibility of the menopause as a factor. No patient who had had both ovaries or the uterus removed was included. Since the data obtained on history were not considered reliable, they have not been reported in detail.

In order to contrast our series with a control group, reference was made to reports in the literature on the menstrual interval in normal women. Such records have been tabulated by Foster(6), Pratt, Allen, Newell and Bland(7), King(8), Allen(9), Fluhman(10), Latz(11), Latz and Reiner(12), Richards(13), Gunn, Jenkins and Gunn(14), Arey(15), and others. The study of Arey was chosen for comparison with our group because of the comprehensive data given. Some 20,000 calendar records of 1,500 women and girls in twelve different reports were assembled, corrected and analyzed.

In 31 of the 221 cases vaginal smears were taken, usually at daily intervals by the method described by Papanicolaou(16), so that more detailed information could be obtained about changes in the menstrual cycle than could be revealed by observations on the gross bleeding.

### OBSERVATIONS

#### I. GENERAL DATA

In Table I, general data on our subjects and those summarized by Arey<sup>2</sup> are given. In our group the age range is less than that of Arey. His inclusion of subjects up to the age of 51 would indicate that some individuals might have menstrual irregularities due to the climacterium. Although his group is said to be normal, it must be considered that emotional disturbances may have been present in some of the subjects in his series.

<sup>2</sup> In Tables I and II and Chart IV the system of Arey has been followed in order to contrast our series with a normal group.

The mean age shows but slight variation between the different groups. Although the number of cycles of those subjects with schizophrenia and depression represents a fair sampling, the number of cycles of those with elation is small.

## 2. MENSTRUAL INTERVAL

The distribution frequency according to the length of the menstrual interval was tabulated. The data obtained are graphically represented in Charts I, II, and III, in which

of the intervals were longer than the most frequent cycle length. There was also a large percentage of shorter cycles, but one should consider that a number of abnormal bleedings which do not represent actual cycles is included in this group. A high frequency of critical ratios<sup>3</sup> of two or over was found. This signifies that there are 98 chances in a hundred that the differences in distribution frequency are greater than zero between the normal series and the schizophrenic, depressive and total group. The

TABLE I  
GENERAL DATA

| Group               | Total no. of subjects | No. of subjects with two or more periods | Age range at start | Mean age | Total no. of cycles | Mean no. of cycles per subject |
|---------------------|-----------------------|------------------------------------------|--------------------|----------|---------------------|--------------------------------|
| Schizophrenia ..... | 114                   | 97                                       | 13-40              | 27.8     | 436                 | 4.4                            |
| Depression .....    | 81                    | 67                                       | 16-40              | 29.7     | 286                 | 4.3                            |
| Elation .....       | 26                    | 23                                       | 18-40              | 28.1     | 95                  | 4.0                            |
| Total .....         | 221                   | 187                                      | 13-40              | 28.5     | 817                 | 4.3                            |
| Arey .....          | 1,089                 |                                          | 12-51              | 26.1     | 12,452              | 10.7                           |

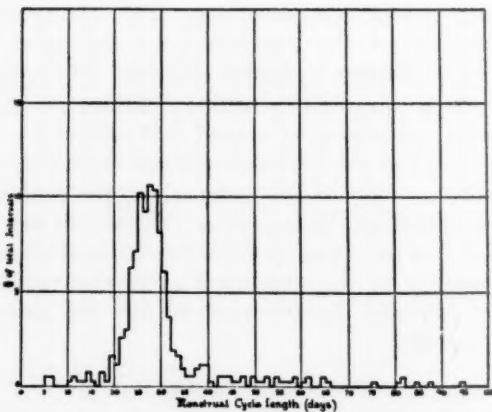


CHART I.—Ninety-seven cases with schizophrenia (436 cycles).

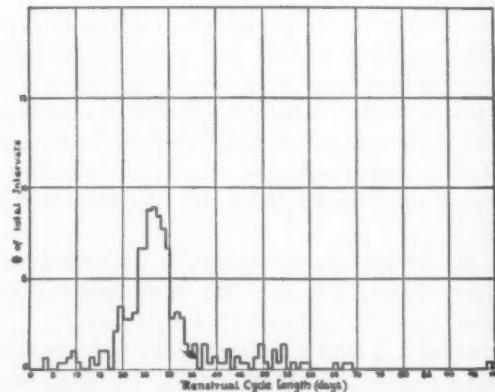


CHART II.—Sixty-seven cases with depression (286 cycles).

the percentage of total intervals is plotted on the ordinate and the cycle length on the abscissa. Those patients who had no bleeding or who had only one menstrual period during the time of observation were omitted. In order to show the wide spread, intervals up to 100 days were used. In Chart IV our total cases and those of Arey are compared. In this chart the intervals below 21 and above 35 days were grouped together as in Arey's classification.

In our cases a relatively large percentage

figures obtained for those with elation suggested variations from the normal, but indicated that no statistically valid conclusion could be drawn for this group. The small number of subjects decreased the reliability of the data.

In Table II data on the distribution of

<sup>3</sup> Critical ratios were obtained by dividing the actual difference in percentages by the standard error of the difference between two percentages, using the percentage distribution frequency of our cases and those of Arey.

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TABLE II  
DATA ON THE DISTRIBUTION OF MENSTRUAL CYCLES

| Source        | Mean cycle length (days) | Standard deviation of cycles from mean | Probable error of standard deviation $\pm$ | Coefficient of variation | Probable error of coefficient of variation $\pm$ |
|---------------|--------------------------|----------------------------------------|--------------------------------------------|--------------------------|--------------------------------------------------|
| Schizophrenia | 31.1                     | 16.70                                  | 0.38                                       | 53.65                    | 1.21                                             |
| Depression    | 29.7                     | 14.57                                  | 0.41                                       | 49.06                    | 1.37                                             |
| Elation       | 29.7                     | 13.52                                  | 0.65                                       | 45.52                    | 2.20                                             |
| Total         | 30.5                     | 15.65                                  | 0.26                                       | 51.31                    | 0.85                                             |
| Arey          | 28.4                     | 4.92                                   | 0.12                                       | 17.03                    | 0.39                                             |

menstrual cycles according to the length of the interval are shown. The mean cycle lengths in schizophrenia, depression, elation, and the total of these three were longer than in Arey's normal group, notwithstanding the inclusion of some very short intervals due to abnormal bleeding. The standard deviation of cycles from the mean and the coefficient of variation showed significant deviation indicating a much wider spread in cycle length among our subjects than among the normal group.

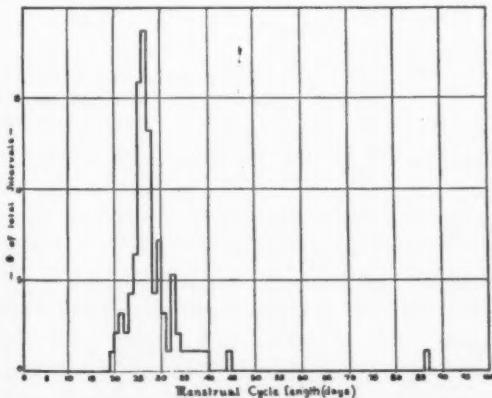


CHART III.—Twenty-three cases with elation (95 cycles).

A relatively large number of long cycles, those from 35 to 59 days, was shown by the fact that such intervals were present in 35 cases of schizophrenia (31%), in 28 cases of depression (33%), in 5 cases of elation (19%), and in a total of 68 cases (31%). Intervals of 60 days or over which are grouped as amenorrhoeas also were frequently observed. There were 20 in schizophrenia (18%), 11 in depression (14%), and 3 in elation (12%), making a total of 34 (15%) for the whole group.

Two of the standard deviations as calcu-

lated by Arey were selected, that of Latz and Reiner (12) which was low, and that of Fluhman (10) which was high, so that comparisons could be made between our cases and analogous normal cases. The critical ratios of the difference between the standard deviations of our group and of these workers are given in Table III. The results obtained

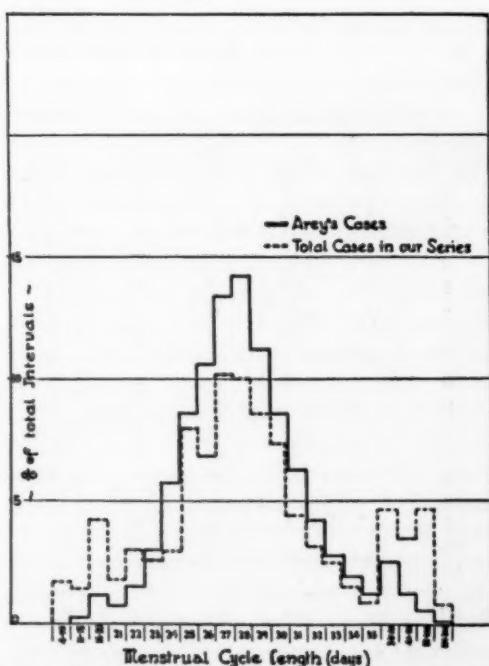


CHART IV.—Two hundred and twenty-one cases (817 cycles) compared with Arey's group of 1,089 cases (12,452 cycles).

give statistically significant figures with the exception of the comparison between those of Fluhman and our cases with elation.<sup>4</sup>

<sup>4</sup> The chances are .97 in 100 that the observed difference between the standard deviations of the cycles in the elation group, and Fluhman's group is greater than zero.

### 3. DURATION AND AMOUNT OF MENSTRUAL BLEEDING

During hospitalization, observations were made on the duration and the amount of bleeding at the time of each menstruation. In Table IV the number of days of bleeding, the amount of bleeding, and the time of each

### 4. VAGINAL SMEAR OBSERVATIONS

Vaginal smear studies were made in 31 patients. In this group 14 had schizophrenia, 14 depression and 3 elation. Of these only a small number, two with schizophrenia, two with depression and one with elation, showed entirely normal cycles. Another five with

TABLE III  
COMPARISON OF STANDARD DEVIATIONS

|                      | No. of cycles | Standard deviation | C/R vs.<br>Latz and Reiner | C/R vs.<br>Fluhman |
|----------------------|---------------|--------------------|----------------------------|--------------------|
| Schizophrenia .....  | 436           | 16.70              | 23.6                       | 9.0                |
| Depression .....     | 286           | 14.57              | 18.5                       | 4.4                |
| Elation .....        | 95            | 13.52              | 10.5                       | 1.9                |
| Total .....          | 817           | 15.65              | 30.9                       | 8.3                |
| Latz and Reiner..... | 1,113         | 3.27               | ...                        | ..                 |
| Fluhman .....        | 747           | 11.58              | ...                        | ..                 |

TABLE IV  
DURATION AND AMOUNT OF MENSTRUAL BLEEDING

| No. of days of bleeding | No. of Menstrual Periods |      |         |            |      |         |         |      |         |       |      |         |
|-------------------------|--------------------------|------|---------|------------|------|---------|---------|------|---------|-------|------|---------|
|                         | Schizophrenia            |      |         | Depression |      |         | Elation |      |         | Total |      |         |
|                         | Scant                    | Mod. | Profuse | Scant      | Mod. | Profuse | Scant   | Mod. | Profuse | Scant | Mod. | Profuse |
| 1                       | 3                        | 12   | 2       | 3          | 2    | ..      | 5       | 2    | ..      | 11    | 16   | 2       |
| 2                       | 13                       | 30   | 2       | 8          | 31   | ..      | 3       | 8    | ..      | 27    | 69   | 2       |
| 3                       | 16                       | 102  | 6       | 10         | 53   | 3       | 2       | 16   | 3       | 28    | 171  | 12      |
| 4                       | 11                       | 135  | 6       | 8          | 78   | 4       | 2       | 31   | 3       | 21    | 244  | 13      |
| 5                       | 8                        | 93   | 7       | 6          | 64   | 2       | 2       | 19   | 2       | 16    | 176  | 11      |
| 6                       | 4                        | 41   | 4       | 4          | 22   | 4       | ..      | 6    | 2       | 8     | 69   | 10      |
| 7                       | 2                        | 18   | 2       | 5          | 7    | ..      | ..      | 2    | 1       | 7     | 27   | 3       |
| 8                       | 1                        | 1    | ..      | 2          | 5    | ..      | ..      | ..   | ..      | 3     | 6    | ..      |
| 9                       | ..                       | 2    | ..      | 1          | ..   | ..      | ..      | ..   | ..      | 1     | 2    | ..      |
| 10                      | ..                       | ..   | ..      | 2          | 1    | ..      | ..      | ..   | ..      | 2     | 1    | ..      |
| 11                      | ..                       | ..   | ..      | 2          | ..   | ..      | ..      | 1    | ..      | 2     | 1    | ..      |
| 12                      | ..                       | ..   | ..      | 1          | ..   | ..      | ..      | ..   | ..      | 1     | ..   | ..      |
| 13                      | ..                       | ..   | 1       | ..         | 1    | ..      | ..      | ..   | ..      | ..    | 2    | ..      |
| 14                      | ..                       | 1    | ..      | ..         | ..   | ..      | ..      | ..   | ..      | ..    | 1    | ..      |
| 15                      | ..                       | 1    | ..      | 1          | ..   | ..      | ..      | ..   | ..      | 1     | 1    | ..      |
| 16                      | ..                       | ..   | ..      | ..         | ..   | ..      | ..      | ..   | ..      | ..    | ..   | ..      |
| 17                      | ..                       | ..   | ..      | 1          | ..   | ..      | ..      | ..   | ..      | 1     | ..   | ..      |
| Totals                  | 58                       | 437  | 29      | 54         | 264  | 13      | 14      | 85   | 11      | 126   | 786  | 53      |
| Per cent of total       | 11.1                     | 83.4 | 5.5     | 16.1       | 80.0 | 3.9     | 12.7    | 77.3 | 10.0    | 13.1  | 81.4 | 5.5     |

menstruation are summarized. The duration of bleeding varied from 1 to 17 days, with the greatest number on the fourth day. Only a few bleeding phases lasted more than seven days. The percentage of scant bleedings was higher than that of profuse bleedings. In the cases with protracted bleeding there was often a continuation of slight bleeding in the form of spotting.

schizophrenia and another six with depression showed some normal cycles, but at the same time a number of irregular periods.

The patients who had normal menstrual cycles had well expressed follicular reactions. Only four women, however, two with schizophrenia and two with depression, had what one might call a strongly expressed follicular stage. Fig. I illustrates such a reaction. In

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most cases the follicular phase was not entirely typical.

Of relatively frequent occurrence was a delay in the appearance of the follicular phase resulting in a retarded appearance of the next menstrual flow. Menstrual cycles with long intervals (35 to 59 days) were present in 13 of the 31 patients (42%). They were observed in seven cases of schizophrenia (50%), in five cases of depression (36%), and in one case of elation. In most patients with abnormally long intervals the follicular reaction was either poorly expressed or absent. Fig. II illustrates such an atypical follicular reaction in which cornified cells of the follicular type are intermixed with smaller, round or oval "deep" cells, indicative of a subnormal ovarian estrogenic secretion.

Amenorrheas of sixty days or longer were present in eight patients (26%): three with schizophrenia (21%), four with depression (29%), and one with elation.<sup>5</sup> In the case with elation the smear was of atrophic type (Fig. III) which is commonly seen in the menopause (17, 18) and indicates that little or no estrogenic hormone is being secreted by the ovary. A similar type of smear can be produced experimentally by the administration of the androgens (19, 20). In the three cases of schizophrenia and three of depression, the smears, as shown in Fig. IV, were of the type found in secondary amenorrhoeas (21). In such smears the cells are relatively small and crowded, contrasting with the larger and more discrete cells found during the various phases of the normal sex cycle (compare with Figs. I and V). In one depressive case the smear was intermediate between an atrophic and a crowded type.

Short cycles with an interval of 21 days or less were rare. A 19 day interval was observed in a case of depression; in this case, as well as in one with schizophrenia, there was a persistence of numerous cornified cells during the premenstrual phase. In the normal premenstrual stage the number

of the cornified cells decreases gradually as shown in Fig. V.

The bleeding was moderate in most instances (Fig. VI). Scant bleeding was, however, relatively frequent, more particularly in the cases in which the follicular reaction was poorly expressed and the interval was lengthened. In two patients with depression there was a prolonged spotting. Very profuse bleeding was not noted in any of the 31 cases. An excess of mucous secretion was found in two cases, and excess of leucocytes in four cases. In one of the last cases the gynecological examination revealed the presence of a mild endocervitis. In three cases with amenorrhea, prior to the return of bleeding, a smear type indicative of a subnormal ovarian function was replaced by one reflecting the appearance of normal cyclic ovarian functions.

Further evidence of endocrine abnormality was shown by the presence in nine cases of a hypoplastic uterus on gynecological examination. The history of abnormality in the menstrual cycle prior to the onset of mental illness was obtained in five of the nine cases. This suggests that in some cases the development of the illness was preceded by an early glandular disorder.

Menstrual irregularity was often correlated with the beginning of the illness. Conversely, with improvement in the mental symptoms, the menstrual cycle became normal. While under observation eight patients showed a return to a more normal menstrual cycle accompanying or following marked improvement in clinical symptoms. In no case did increased abnormality of the vaginal smear occur when there was improvement in the mental condition. An analysis of the possible relationship between such emotional reactions as depression, anxiety, and fear failed to reveal a definite positive correlation between them and abnormalities of the menstrual cycle, except in so far as the emotions were part of the general clinical syndrome.

#### DISCUSSION

The statistical data presented in this paper indicate that the menstrual cycle in women with schizophrenia and affective disorders is characterized by the frequent appearance

<sup>5</sup> The percentages for long cycles and amenorrhoeas are higher in these 31 cases than in the total 221 patients. The figures for the small group cannot be considered statistically reliable.

of menstrual irregularities. These irregularities are probably the result of a factor acting adversely upon the ovaries, and more particularly upon the growing follicles.

A mild and temporary disturbance, which would retard the normal development and maturation of the follicles, would result in a delay of the ovulatory reaction and in a prolongation of the menstrual cycle. Such a retardation of the follicular growth and of the interval was frequent. A stronger and more prolonged disturbance would tend to further suppress the follicular growth and to cause a longer delay of the menstrual cycle, resulting in an amenorrhoic condition. Amenorrhea might thus be considered as representing a more advanced degree of the suppression of the ovarian and menstrual functions.

Observations on vaginal smears offered evidence in favor of this interpretation. They showed that the follicular reaction, which reflects the changes occurring during the final development of the ovarian follicles, was either delayed or suppressed in cases in which prolongation of the menstrual cycle or amenorrhea occurred.

The occasional, although not infrequent, appearance of very short cycles was in all probability due to a stronger and more abrupt effect upon the Graafian follicles causing their involution. This would result in the suppression of the normal ovulatory process and in the earlier appearance of the menstrual flow. Evidence for this is offered by the absence in the vaginal smears of a normal follicular reaction in cases of this type.

With regard to the nature of the factors responsible for these suppressive effects upon the ovarian functions, no direct information could be obtained. The relationship between nervous impulses and the function of the female reproductive organs still remains obscure(22). It is very likely that in some patients the normal physiological balance was disturbed, but whether this was a primary condition or secondary to the disturbed psychological processes could not be ascertained. There was, however, an evidence of a relationship between the severity of the mental illness and the degree of the ovarian dysfunction. An improvement in the

psychopathologic condition of the patient was usually accompanied by an improvement in the ovarian and menstrual functions.

The degree of abnormality often appeared to depend on the severity of the illness, rather than on the intensity of the emotional reaction. This fact seems to be in contrast to the findings of Allen and Henry(5) which suggest dependence of the menstrual disorder on the intensity of the emotions. The fact that patients with equally marked mental symptoms showed variability in the vaginal smear findings indicates that the degree of ovarian dysfunction depends on the reaction of the individual as well as on the severity of the mental illness. No type of menstrual abnormality which could be considered characteristic of the mental disorder was found.

In regard to the factors involved in subnormal ovarian function, the role of starvation should be considered. It has been noted that a marked loss of weight may result in a suppression of the menstrual functions (23), and in an atrophic type of vaginal smear(24, 25). The fact that only five of the 31 cases studied showed any appreciable undernourishment indicates that this factor has not been of major importance in this group.

#### SUMMARY

Observations were made on 817 menstrual bleedings of 221 patients suffering from schizophrenic and affective disorders. A more detailed study has been made in 31 cases by an analysis of the vaginal smears. A greater irregularity in menstrual interval than in a comparable normal group was found. A tendency to a delay, a weakened expression, or a temporary suppression of the follicular reaction was noted. Prolongation of the menstrual interval or amenorrhea was frequent. Short cycles also were observed. All these abnormalities are interpreted as the result of an adverse effect upon the growth of the ovarian follicles. A correlation between the severity of the illness and the degree of abnormality of the menstrual cycle was found. An improvement in the mental condition was usually accompanied by a change to a more normal menstrual function. The existence of an etiological relationship could not be ascertained.

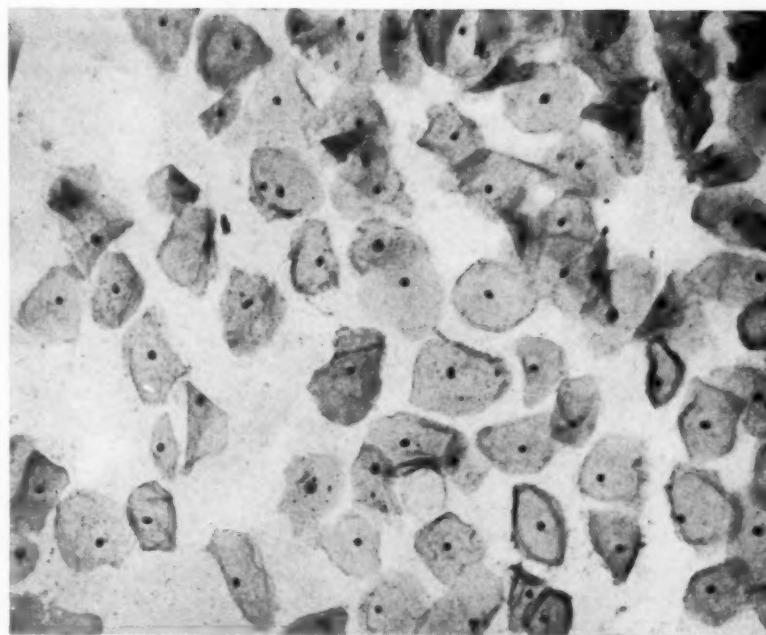


FIG. I.—Follicular type of smear, indicative of a good follicular reaction. Note leucopenia and prevalence of flat squamous cells with pyknotic nuclei. Most of the cells are cornified.<sup>6</sup>

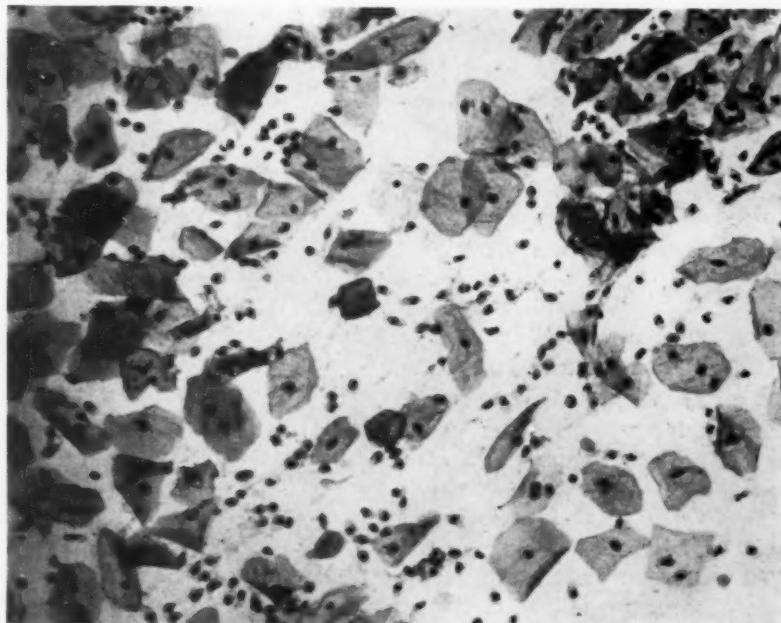


FIG. II.—Mixed type of smear indicating an atypical follicular reaction. Note presence of follicular type cells, (cornified) as in Fig. I, of small rounded cells, and of numerous leucocytes.

<sup>6</sup> Magnification X 250. Microphotographs by A. Gravesen.

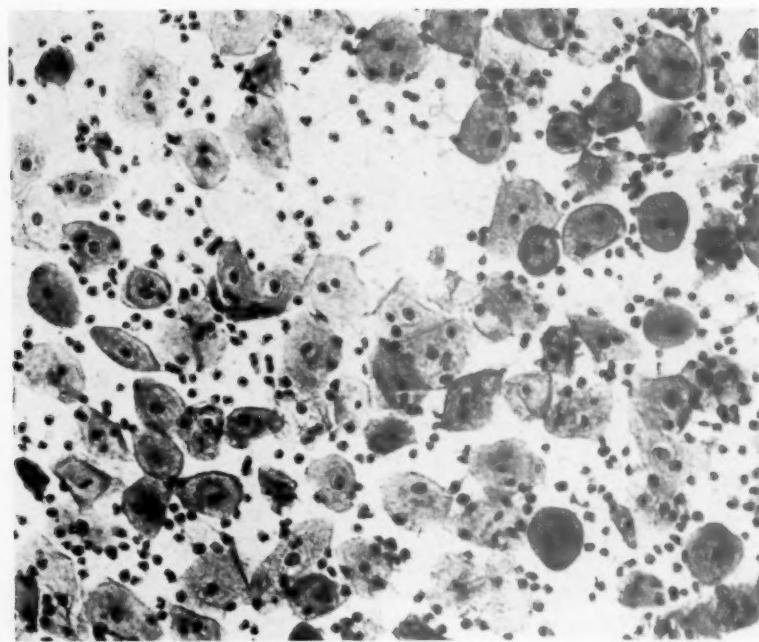


FIG. III.—Atrophic type of smear, usually found in primary amenorrheas.  
Note large number of small, rounded ("deep") cells.

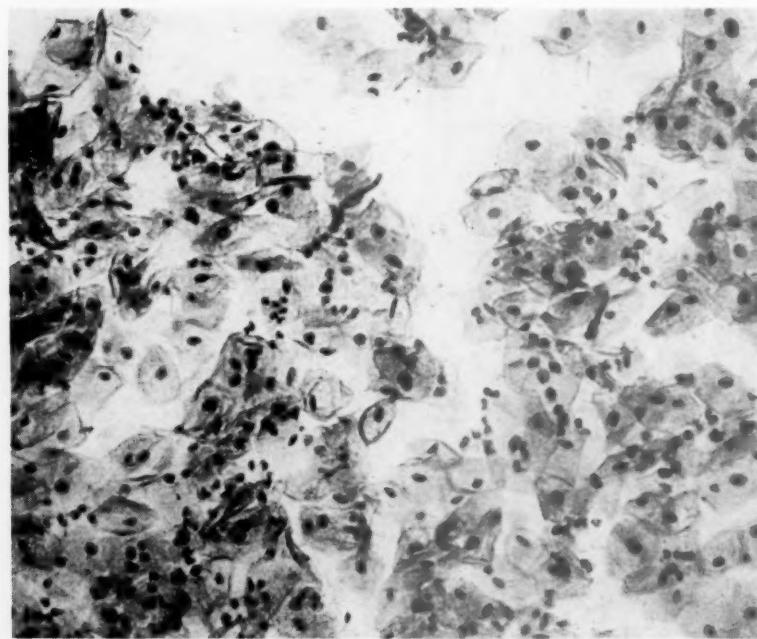


FIG. IV.—Crowded type of smear usually found in secondary amenorrheas.  
Note crowded condition of cells.

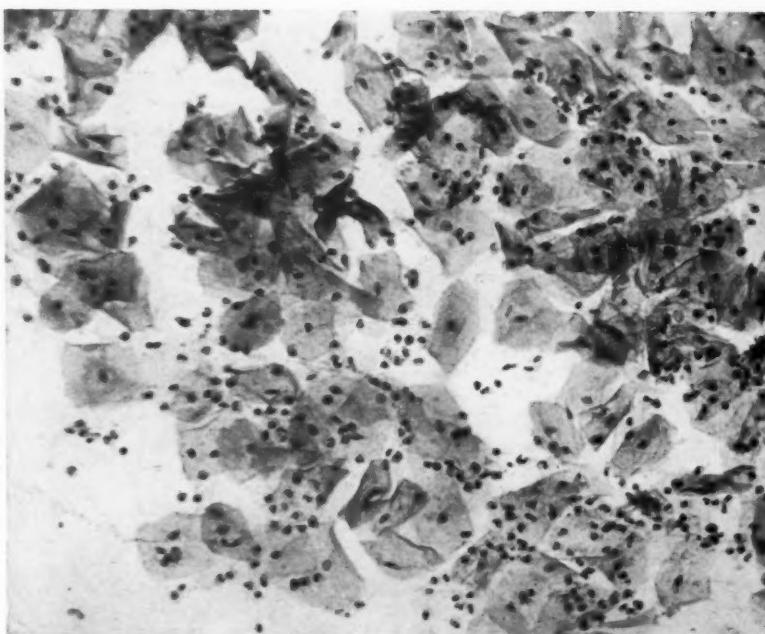


FIG. V.—Premenstrual smear type. Note characteristic grouping of squamous cells with larger nuclei than in Fig. I, and presence of leucocytes. Small nucleated cornified cells decrease during this phase.

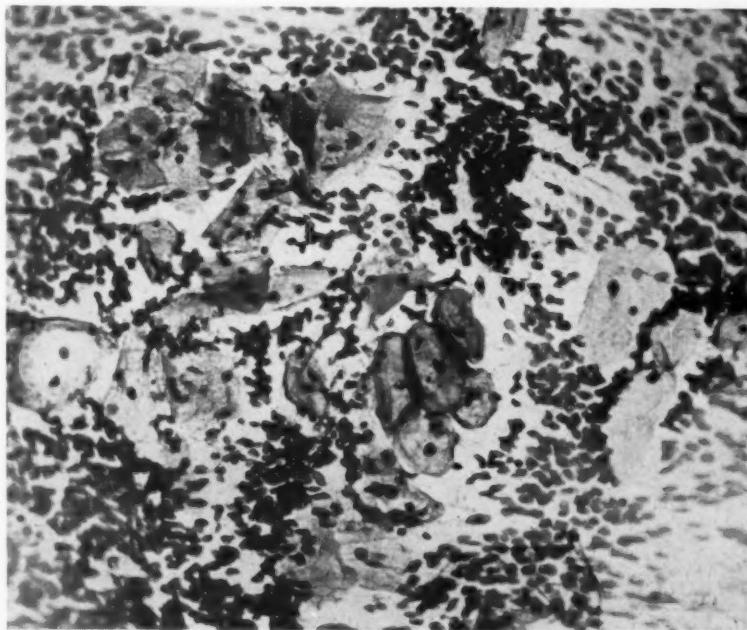


FIG. VI.—Menstrual smear type. Note large number of erythrocytes, several squamous cells and a dark cluster of endometrial cells carried by the blood into the vagina.

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## CONVULSIONS OF EARLY LIFE AND THEIR RELATION TO THE CHRONIC CONVULSIVE DISORDERS AND MENTAL DEFECT<sup>1</sup>

By DOUGLAS A. THOM, M.D.<sup>2</sup>

In an effort to obtain a clearer understanding of the relationship between the convulsions of infancy and childhood and the chronic convulsive disorders of later life, much work has been done by pediatricians, neurologists, pathologists, psychiatrists and biochemists which is indicative of the broad interest this subject has attracted. Our understanding of the convulsive disorders began to increase when we discarded the old concept of "epilepsy" as being a disease entity and considered the convulsive phenomena and loss of consciousness as being but a symptom of some underlying pathological (histological or biochemical) situation.

It is not a simple task to correlate satisfactorily the relationship between infantile convulsions and the chronic convulsive disorders of later life. A child may have a convulsion, or even a series of convulsions, during the pre-school years and then have a long remission, followed by recurring spells at the time of puberty or later. The relationship between infantile convulsions and later epilepsy may be more apparent than real. Convulsions in the same individual may be caused by quite different and independent factors at different age periods. Then again, early convulsions may be but evidence of neurological damage that eventually manifests itself in mental deficiency or epilepsy. Yet the epileptologist, psychiatrist and neurologist have had but a limited opportunity to study this interesting material during the early years of the child's development or they have failed to utilize the material available for study. At the present time we do not have sufficient clinical data with which to evaluate the importance of the age factor, the frequency, the type of convulsion, the significance of precipitating causes, the ef-

fect of the convulsions on mental development, and the relation that exists between physical manifestations, neurological signs and the convulsion.

Of 5408 consecutive admissions to a large metropolitan hospital for children convulsions were recorded in about one per cent of the cases (1), obviously many convulsions being entirely overlooked or ignored as of little importance. After a child has had two or three convulsions, the family frequently fails to call the physician to the home, knowing from experience that by the time he arrives the fit is over and there seems to be nothing to do but wait for the next one. If the child's spells continue at irregular intervals and at the age of five or six he is sent home from school because of his seizures, or has some serious accident due to a spell, the parents begin to question the assurance they were given about the child's "outgrowing" his trouble and again medical advice is sought.

Convulsions during infancy and childhood are not taken very seriously by the average medical man, as indicated by the following statement taken from a book published late in 1940:

Seizures other than true epileptic fits can occur at all ages in children. Early convulsions may have the same significance as the shivering and collapse which are common at the onset of any illness. Sometimes convulsions accompany teething. Such isolated incidents need not be looked upon seriously if the child is otherwise healthy and well. If, on the other hand, he is abnormal temperamentally or mentally defective, then steps should be taken to ascertain whether there is any exciting cause that can be eliminated (2).

It would perhaps be better medicine not to wait until the child shows abnormality in temperament or evidence of mental defect before attempting to determine the cause of these early convulsions and to utilize such medical knowledge as we have in an effort to control the convulsions and at least minimize their effect upon the nervous system. Many children might be a little less abnor-

<sup>1</sup> Read at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

<sup>2</sup> Director, Habit Clinic for Child Guidance, Boston, Mass., Professor of Psychiatry, Tufts Medical School.

## MATERIAL AND METHODS

This report is concerned with a group of 3461 children, selected only insofar as they represent the off-spring of 914 families who were under the care of the Community Health Association, a private organization providing nursing care to some 4000 families in the city of Boston. As a group they are a fairly typical cross-section representing the working class of a large city who seek medical care from hospitals and outpatient clinics.

From the information gathered with the assistance of a trained social worker and graduate public health nurses, we found that convulsions occurred in 186 of the 914 families studied and in 233 of the total of 3461 children about whom information was ob-

Table I indicates the incidence of early convulsions as they are related to the chronic convulsive disorders of later life. The fact

TABLE I  
INCIDENCE OF EARLY CONVULSIONS IN RELATION TO EPILEPSY

| Author               | Epileptics          | Infantile convulsions |       |
|----------------------|---------------------|-----------------------|-------|
|                      |                     | 187                   | 40%   |
| Osler (3)            | 460                 | 554                   | 39%   |
| Burr (4)             | 1,654               | ...                   | 42%   |
| Still (5)            | (Children under 12) | 98                    | 19.6% |
| Patrick and Levy (6) | (Idiopathic)        | 150                   | 50%   |
| Thom (1)             | (Institutional)     |                       |       |

that the authorities quoted have studied quite different sorts of cases undoubtedly accounts for the discrepancies in their findings.

In their article "Convulsions in the Chronic Nervous Diseases of Infancy and Childhood" (7) Dr. Pigott and his associates, Drs. Weingrow and Fitch, have made a very valuable and stimulating contribution to the problem of infantile convulsions and the etiological factors in epilepsy. Dr. Pigott states that epilepsy is largely a disease of infancy, childhood and adolescence since the average age at onset in 1000 cases was 11.1 years. He was interested in the institutional epileptic and his approach was from epilepsy in adults back to the convulsions of infancy and childhood. The author's approach has been to follow the subsequent course of the convulsions of infancy toward adolescence and adult life. (I think it is generally agreed that some 75 per cent of all chronic convulsions begin by the fifteenth year.)

tained. That is, one child in 14, approximately 6.7 per cent of this unselected group of children, had one or more convulsions. It is interesting to note that this percentage is almost identical with the findings of a study made by the author in 1927 (8), where of a total of 5362 children, 365 had had one or more convulsions. The figures for the 1927 and 1940 studies combined are as follows:

|                                            |       |
|--------------------------------------------|-------|
| Total families investigated.....           | 2,653 |
| Total children investigated.....           | 8,823 |
| Total children having had convulsions..... | 598   |
| Frequency of convulsions.....              | 6.7%  |
| Total families with convulsions.....       | 479   |

Other studies of the frequency of infantile convulsions have obtained figures presented in Table II.

Our present interest is in the 233 children of the 1940 study reported to have had one or more convulsions. Of this group 45 were dead at the time the investigation began, and of the remaining 188 living children only 130 were studied because of difficulty

in locating families or obtaining the desired information.

Of these 130 cases investigated 13 children (10 per cent) continue to have convulsions. Five of these convulsive children and 10 children not having convulsions are mentally defective, that is, they have been rated between idiot level and I. Q. of 75 when measured by standard tests, or have been judged definitely defective by competently trained persons. School achievement and social adjustment are consistent with intellectual level in these children. A total of 23 children of the group of 130 studied are, therefore, either continuing to have convulsions or are mentally defective.

A second group of 17 children are considered retarded, though a diagnosis of mental defect has not been made; they have

tween capacity and performance, but cannot be classified in either of the above categories as far as mental status is concerned. A. Q., a boy now seventeen, is an example of this group:

In 1938 A. Q. was committed to the Lyman School (for delinquent boys) where he received an I. Q. rating of 91 on the new Stanford-Binet and 92 on the Detroit learning aptitude test. On the school tests he did sixth and seventh grade work in all subjects except arithmetic and spelling which were of fourth grade quality. The 1940 report states that he was doing fair work in high school. He had no hobbies or interests of any sort and needed constant supervision at Lyman. The psychologist stated, "because of his attitude, we cannot be hopeful for an adequate social adjustment."

These results, compared with those of the 1927 study, appear in Table III.

TABLE II  
FREQUENCY OF INFANTILE CONVULSIONS

| Author                       | Cases studied | History of infantile convulsions |      |
|------------------------------|---------------|----------------------------------|------|
| Walton and Carter (9).....   | 1,000         | 111                              | 10%  |
| Bullard and Townsend (10)... | 195           | 19                               | 10%  |
| Patrick and Levy (6).....    | 752           | ...                              | 4.2% |
| Thom .....                   | 8,823         | 598                              | 6.7% |

borderline intellectual equipment, intelligent quotients ranging from 75 to 90 on individual or group intelligence tests, and they are unable to compete with other children of their age or to profit by the ordinary methods of education. The case of M. M. who appears in the retarded group is given as an example of this category:

M. M. is now a boy of seventeen who has recently been discharged from school in order to work. His intelligence ratio as determined by group tests given at school was 81. He had no interest in ordinary school subjects and repeated several grades in grammar school. Before leaving school he was receiving marks of B and C in the ninth grade of Opportunity School, a school to which children are referred in order that they may have more shopwork and avoid the necessity of remaining in classes for which they are over-age.

Thirteen other children are classified as having some school difficulty or maladjustment. These children are retarded in school or in development, have adjustment difficulties or give evidence of a discrepancy be-

TABLE III  
INCIDENCE OF MENTAL DEFECT AND CHRONIC CONVULSIVE DISORDER FOLLOWING INFANTILE CONVULSIONS

|                                                                     | 1927     | 1940     |
|---------------------------------------------------------------------|----------|----------|
| Total children, with convolution prior to fifth year, studied ..... | 265      | 130      |
| Children continuing to have convulsions .....                       | 35 (13%) | 13 (10%) |
| Children defective .....                                            | 42 (16%) | 10 (8%)  |
| Children retarded .....                                             | ...      | 17 (13%) |

The foregoing study indicates that infantile convulsions are not infrequently associated with some pathological process which leads to an interference with the normal development of the central nervous system and results in mental defect or a chronic convulsive disorder, occasionally both.

The age at which the first convolution occurred, the precipitating cause, the frequency of the convulsions and the relationship of first convulsions to those that followed, the incidence of single spells and their relative importance, are factors that have been given careful consideration. A considerable number of the whole group are still under fifteen years of age, a period when the incidence of convulsions is likely to increase. Those who are definitely mentally defective, though under fifteen, will continue to appear in the same category, while many of the psychologically and academically retarded may make fairly good social

and economic adjustments. The group as a whole, with additional cases, needs further consideration before we may draw conclusions as to the relative importance of age, frequency, precipitating causes and other related factors. The following findings, however, taken from our recent study of 130 children who had one or more convulsions by the age of five, are suggestive.

#### A. AGE AT FIRST CONVULSION

The majority of first convulsions occurred between six months and two years. Of the 13 epileptic children 9 had their first convulsion during the first year and in 2 other children first attack occurred during the second year. All but one of the defective

#### B. PRECIPITATING CAUSE OF FIRST CONVULSION

This information (Table VII) is probably of little value as most of these children were not seen by a physician at the time of the convulsion and parents are inclined to attach undue significance to such causes as teething, worms, temper, gastrointestinal upsets, falls and frights which probably bore no relation to the attacks. The differences in interpretation of the causes of first convulsion is shown in Table VIII comparing the opinion of physician and parents in regard to the 13 children still having convulsions.

It is significant that in 44 of the 130 cases the first convolution occurred during an acute

TABLE IV  
AGE AT FIRST CONVULSION OF 130 CHILDREN

| Age                                     | Total | Epileptic | Defective | Retarded |
|-----------------------------------------|-------|-----------|-----------|----------|
|                                         | 130   | 13        | 10        | 17       |
| a. One week .....                       | 3     | 1         | ..        | ..       |
| b. One week through 1 mo. ....          | 5     | 3         | ..        | ..       |
| c. Over 1 mo. through 3 mos. ....       | 8     | ..        | 1         | 1        |
| d. Over 3 mos. through 6 mos. ....      | 9     | 1         | 2         | 2        |
| e. Over 6 mos. through 1 yr. ....       | 35    | 4         | 4         | 4        |
| f. Over 1 yr. through 2 yrs. ....       | 36    | 2         | 2         | 3        |
| g. Over 2 yrs. through 3 yrs. ....      | 17    | 1         | ..        | 3        |
| h. Over 3 yrs. through 4 yrs. ....      | 5     | ..        | 1         | 1        |
| i. Over 4 yrs. through 5 yrs. ....      | 8     | 1         | ..        | 2        |
| j. Under 4 (but exact age unknown) .... | 4     | ..        | ..        | 1        |

children had their first convolution during the first two years. (See Table IV.)

A comparison with the results of Peterman's (11) study of 1000 cases yielded the figures shown in Table V.

TABLE V  
AGE AT FIRST CONVULSION

| Age                               | Peterman | Thom  |
|-----------------------------------|----------|-------|
| Birth to one month.....           | 7.9%     | 5.9%  |
| One month to six months.....      | 13.8%    | 12.7% |
| Six months to thirty-six months.. | 44.2%    | 65.7% |
| Three years to ten years.....     | 25.1%    | 13.4% |
| Ten years to sixteen years.....   | 5.6%     | 3.7%  |

A further comparison was made with the results obtained by Stauder (12) in tabulating the 320 cases of childhood convulsions collected by von Lederer (13). Table VI also presents the incidence of single and repeated spells at each age level.

infection. This corresponds with Peterman's (11) finding that in 34 per cent of 1000 cases convulsions were associated with acute infection. Birth trauma was given as cause of first convolution in only 4 cases, but subsequent injuries contributed 6 more cases, so that a total of 10 cases may be attributable to brain damage.

#### C. FREQUENCY OF CONVULSIONS

Fifty-eight of these children had only one isolated convolution with no recurrence; 4 of them are considered defective and 11 retarded according to our criteria described previously. Thirty-seven children had convulsions over an interval of more than one year. This group includes the 13 epileptic children, 4 defective and 4 retarded children, so that of the 37 who had convulsions over a period of more than one year 21 are ab-

normal. The precipitating causes given for the first convolution of the 58 who had only one attack are as follows:

|                              |    |
|------------------------------|----|
| Acute infection .....        | 22 |
| Gastrointestinal upset ..... | 23 |
| Birth injury .....           | 1  |
| Unknown .....                | 12 |

#### E. FAMILY BACKGROUND

In no case was a history of epilepsy in parents given. Other factors regarding family background were not obtained or were considered invalid because of lack of cooperation on the part of the informant.

TABLE VI  
DISTRIBUTION OF CONVULSIONS ACCORDING TO AGE  
(AT FIRST CONVULSION)

| Age                    | 0-2 mos. | 2-12 mos. | 1-3 yrs. | 3-6 yrs. | 6-15 yrs. |
|------------------------|----------|-----------|----------|----------|-----------|
| <b>Total</b>           |          |           |          |          |           |
| Stauder—320 .....      | 43 = 13% | 137 = 42% | 58 = 18% | 30 = 9%  | 52 = 16%  |
| Thom—124 * .....       | 12 = 9%  | 48 = 36%  | 53 = 39% | 15 = 11% | 6 = 4%    |
| <b>Single spell</b>    |          |           |          |          |           |
| Stauder—73 .....       | 15 = 34% | 41 = 30%  | 11 = 19% | 4 = 13%  | 2 = 3%    |
| Thom—68 .....          | 5 = 42%  | 22 = 46%  | 26 = 49% | 11 = 73% | 2 = 33%   |
| <b>Repeated spells</b> |          |           |          |          |           |
| Stauder—247 .....      | 28 = 65% | 96 = 70%  | 47 = 81% | 26 = 86% | 50 = 97%  |
| Thom—66 .....          | 7 = 58%  | 26 = 54%  | 27 = 51% | 4 = 27%  | 4 = 67%   |

\* 134 cases where age of first convolution is known.

TABLE VII  
PRECIPITATING CAUSE OF FIRST CONVULSION AS GIVEN BY PARENT OR NURSE

| Cause                             | Total | Epileptic | Defective | Retarded |
|-----------------------------------|-------|-----------|-----------|----------|
| <b>Total</b> .....                | 130   | 13        | 10        | 17       |
| a. Birth trauma .....             | 4     | 3         | ..        | ..       |
| b. Acute infections .....         | 44    | 1         | 5         | 6        |
| c. Gastrointestinal upsets .....  | 36    | ..        | 1         | 7        |
| d. Traumas .....                  | 6     | 3         | 1         | ..       |
| e. Toxemias (metals) .....        | 3     | 2         | ..        | ..       |
| f. Not significant,* unknown..... | 37    | 4         | 3         | 4        |

\* Causes such as temper, teething, worms, given by parent.

TABLE VIII  
CAUSE OF FIRST CONVULSION IN THIRTEEN EPILEPTIC CHILDREN

| Physician's judgment                | Parent's Statement   |
|-------------------------------------|----------------------|
| "Organic" .....                     | Birth trauma ..... 3 |
| Pneumonia .....                     | Pneumonia ..... 1    |
| "Question of lead".....             | Trauma ..... 3       |
| High temperature, no infection..... | Toxemia ..... 2      |
| "Idiopathic" .....                  | Worms ..... 1        |
|                                     | Unknown ..... 3      |

#### D. DESCRIPTION OF CONVULSIONS

Duration and descriptions of convulsions cast little light on the problem. Parents recognized the loss of consciousness and tonic and clonic phases of the fit, but rarely had any idea in what part of the body the convolution originated or the progress of its march.

Of the 121 families receiving intensive study 35 families included two or more children who had had one or more convulsions. In these 35 families there were 244 children; 221 were living and 23 were dead at the time of the investigation. Eighty-seven (36 per cent) of these children have had convulsions. Of 76 living children who have

had convulsions 6 continue to have convulsions, 6 are defective and 11 are retarded. When two or more children in the same family have convulsions it may be considered as evidence of some constitutional instability in the family background, and when we find a scattering of mental defect in these same families, it confirms our conclusion of hereditary taint. Family L. presented below is an extreme example:

Of 11 living children in Family L. 6, have had one or more convulsions before the fifth year of life. Two of the 6 are still having convulsions. One of these children is now in Monson (a State Hospital for epileptics) where she is rated as having an I. Q. of 44. The other child had an I. Q. of 61 when tested by the school department at the age of thirteen and was placed in a special class. In these two cases first convolution occurred at the ages of three and five. The cause of first convolution as reported by the mother was pneumonia in one case and worms in the other.

Four other children in this family had only one convolution each; three of these attacks were associated with acute infection and one with a gastrointestinal upset. The I. Q.'s of three of these children tested on the Stanford-Binet were found to be 75, 81, and 84.

Of the five children in Family L. who have never had a convolution two are definitely retarded in their school work.

#### SUMMARY

My own observations and a study of the literature point to a general agreement, in regard to certain factors, among those working on the problem of infantile convulsions and their relation to subsequent neuropsychiatric disorders.

1. Convulsions repeated over a period of weeks or months during early life are more likely to be followed by epilepsy than a single convolution or a series of convulsions occurring within a relatively short period of a few days or hours.

2. A larger number of children have convulsions during the first year than at any other time. Husler(14) judges that in 41 per cent of his cases the onset of epilepsy was at the age of four. This was not substantiated by our recent study where convulsions beginning in the first year were more frequently followed by serious results. Schrenk(15) finds that the peak in "genuine epilepsy" occurs around the second and the seventh-eighth year of life while the peak in "symptomatic epilepsy" is definitely in the first year of life.

3. The so-called "idiopathic" convulsions are more likely to merge directly into a chronic convulsive disorder than those of any other group except when there is manifest evidence of brain damage.

4. Petit mal attacks occurring during the first two years of life are likely to merge into a chronic convulsive disorder or become associated with mental retardation. (Morse(16); Still(5).)

5. Convulsions *per se* may cause cerebral damage which affects normal brain development, resulting in mental deficiency.

6. The incidence of infantile convulsions in varied samplings of children studied by different investigators appears to range from 7 to 10 per cent. The author found that 7 per cent of an unselected group of children had infantile convulsions. A fairly large percentage of all those suffering from epilepsy in adult life give a history of having had one or more convulsions prior to the fifth year of life. Of a series of 300 epileptics studied at a state hospital for epileptics(1) 50 per cent gave a history of infantile convulsions.

It has been shown by the author over a period of years that less than 1 per cent of 8000 unselected children developed epilepsy, but that 48 (12 per cent) of a total of 395 children having a history of infantile convulsions developed a chronic convulsive disorder. This would indicate that the child having a history of infantile convulsions is twelve times more vulnerable to epilepsy than a child without a history of infantile convulsions. Still(5) found that 28 per cent of the infantile attacks merged directly into epilepsy. Patrick and Levy(6) found that 4 per cent of their non-epileptics had infantile convulsions, as compared with 20 per cent of their epileptics. According to these results infantile convulsions increase the chances of epilepsy five times. Whatever the ratio may be, it seems quite evident that infantile convulsions do tend to increase materially the risk of epilepsy and mental deficiency in later life.

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## REVIEW OF PSYCHIATRIC PROGRESS 1941

### ADMINISTRATIVE, MILITARY AND FORENSIC PSYCHIATRY

BY WINFRED OVERHOLSER, M. D., WASHINGTON, D. C.

#### ADMINISTRATIVE PSYCHIATRY

At least 46 articles have appeared during the year which may be classed as dealing with administrative psychiatry, covering a multiplicity of problems in the field. A few are selected as illustrative; space forbids a complete review. Anderson (*Bull. Menninger Clinic*, 5: 56-60, Mar. 1941) describes the organization and function of prescribed social gatherings in the treatment of the mentally ill. Burling (*Am. J. Orthopsychiat.*, 11: 48-55, Jan. 1941) discusses the rôle of the professionally trained mental hygienist in business. He suggests that some industrial psychiatry could well start on the executive! Dayton (*Am. J. Psychiat.*, 98: 159-172, Sept. 1941), on the basis of a long and rich experience, deals with the usefulness of statistics to the administrator. "Careful study of the figures on movement of patient population will tell . . . a great deal about the efficiency of his standard procedures in these matters." Kilpatrick (*Psychiatric Quart.*, 15: 823-830, Oct. 1941) presents practical problems arising from tuberculosis surveys in mental hospitals. He recommends chest x-rays of all patients and employees, including staff, at yearly intervals as a means of saving in health, money and efficiency. Molholm and Barton (*Am. J. Psychiat.*, 98: 33-41, July 1941) present the Worcester practice of family care in the rehabilitation of mental patients; the emphasis is laid on the use of this procedure in convalescent patients as a "way-station" on the road to full community life. Page and Page (*J. Abn. and Soc. Psychol.*, 36: 433-435, July 1941) in a study of criteria for mental hospitalization find that 18 per cent "engaged in behavior directly affecting the safety and welfare of others, 74 per cent in behavior detrimental to the self, and 99 per cent in actions which . . . were disturbing to others because of their bizarre nature."

#### MILITARY PSYCHIATRY

A review of the literature on military psychiatry for the current year which would approach completeness is obviously beyond the limits of available space. Practically all of the available references are, of course, British or American. The former deal with studies of relatively small groups of war casualties and with the effects of bombing and evacuation from the cities upon the civilian population. The American literature deals largely with the psychiatric selection of men for military service and with civilian morale. The output on both sides of the Atlantic has been considerable and the content valuable and interesting. Your reviewer has assembled over 125 references, with no pretense that this list is comprehensive; the number, however, gives an idea of the interest in the subject.

The most comprehensive survey published this year is probably that by Billings (*Am. J. Med. Sci.*, 201: 905-918, June 1941), covering by topics the literature from 1938 into the early part of 1941. Likewise attention should be directed to Volume I (pub. Aug. 1941) of the *Abstract Service on Military Psychiatry* of the Massachusetts Department of Mental Health. This mimeographed volume of 158 pages presents abstracts of one to four pages of 74 significant articles on the subject; it is a valuable compendium. Zabriskie and Brush (*Psychosomatic Med.*, 3: 295-329, July 1941), in an article entitled "Psychoneuroses in War Time," present, in addition to an account of the former's rich experience in the A.E.F., a critical review of the literature on war neuroses. Lauren H. Smith (*Med. Clinics of N. America*, 25: 1717-1759, Nov. 1941) presents an excellent résumé of the psychiatric aspects of military medicine. Among the books published during the year one should especially note A. Kardiner's "Trau-

matic Neuroses of War," published as one of the Psychosomatic Medicine Monographs and also by Paul Hoeber.

On the subject of civilian morale, the most important publication of the year is "German Psychological Warfare," a volume of 155 pages issued by the Committee on National Morale. To illustrate its comprehensiveness, it may be said that 561 references are given in the bibliography. It is a volume which should be studied by everyone interested in the vital problem of morale. Glover (*Int. Journ. Psychoanalysis*, 22: 132-146, 1941, part 2) presents "Notes on the Psychological Effects of War Conditions on the Civilian Population." Brown (*Lancet*, 240: 686-691, May 31, 1941) divides civilian psychiatric air-raid casualties into: mild and severe emotional shock, which may be produced by a severe bombing in normal people; psychoneurosis, usually hysteria, psychosis, usually panic and depressive states. He finds many cases of senile dementia precipitated by hospitalization after raids. He comments that the prognosis for neuroses is better among civilians than in the armed forces, by reason of the absence of compensation and other inducement for the continuation of symptoms.

A regimental medical officer, Lt. A. D. Leigh (*Lancet*, 240: 394-396, Mar. 22, 1941) discusses neuroses as they have come to his attention in the British Army. He concludes that "there is no place in the Army for men with effort syndrome, chronic stress dyspepsia, anxiety neurosis or anxiety hysteria, or for mental defectives." He says that many of these cases could be detected by the Local Boards, and urges a rapid examination of every recruit by an experienced psychiatrist. Baillie (*Am. J. Psychiat.*, 97: 753-779, Jan. 1941) summarizes his experience with 200 returned Canadian neurologic and psychiatric casualties. More important is his conclusion that their unsuitability for Army service should have been obvious in 34 per cent on enlistment.

Sutton, in a brief article (*Psychiatry*, 4: 219-223, May 1941) indicates the alertness of the Navy to the value of psychiatry to its problems of personnel, and Martin Cooley (*Psychiatry*, 4: 261-263, May 1941) indicates forcefully the tragic financial conse-

quences of inadequate psychiatric examinations.

Sargent and Craske, working in an Emergency Medical Service Neurological Unit (*Lancet*, 241: 212, Aug. 23, 1941) report that sub-shock doses of insulin, followed by high carbohydrate feedings, produce excellent results in the treatment of acute anxiety states.

The new publication of the Am. Med. Assn., *War Medicine*, has devoted considerable space to psychiatric topics. In the November 1941 issue (Vol. 1, No. 6), for instance, we find articles entitled: "Compensation for War Neuroses," by Ernest Lewy (887-894); "Neurologic and Psychiatric Examinations during Military Mobilization," by John A. Aita (769-780) (a study of 9652 men examined at an induction station); "A Condensed Neuropsychiatric Examination for use by Selective Service Boards," by William C. Menninger (843-853); and "Dementia Praecox in Military Life as Compared with Dementia Praecox in Civilian Life," by A. M. Duval and J. L. Hoffman (854-862).

The fundamental philosophy of the rôle of psychiatry in Selective Service is well expressed in a leading article by C. Macfie Campbell (*J. Am. Med. Assn.*, 116: 1883-1887, April 26, 1941). An authoritative summary of the progress and present state of psychiatry in the Selective Service is to be found in a report by H. S. Sullivan (*Psychiatry*, 4: 440-464, Aug. 1941) which every psychiatrist should read. The long and patient attempts of Dr. Sullivan to make psychiatry an effective tool in the selection of registrants have borne fruit, at least to the extent of what he terms a "good start." Unfortunately, inertia and opposition have caused setbacks to the program, with the result that any serious examinations at the Local Board level seem to be threatened and that Dr. Sullivan has resigned as consultant. He summarizes: "If there are reasonably good results from Selective Service efforts to sensitize the non-medical members of Local Boards to the significance of mental and personality factors; if data of registrants' personal history are assembled on the initiative of Local Boards and supplied to the Army examining boards; if the psychiatrist or psychiatrists on these boards have

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opportunity to study each registrant for an average of fifteen minutes; and if the psychiatric work is both supervised and adequately utilized in the final classification of selectees; the personnel inducted for training and service under this and other plans for the single examination should be satisfactory."

#### FORENSIC PSYCHIATRY

Bromberg (*Federal Probation*, 5: 15-19, July-Sept. 1941) presents a summary of what the psychiatrist can do for the offender who is found neither psychotic nor defective. In the case of probationers he has found group therapy useful, particularly in relieving anxieties and guilt feelings. Aschaffenburg (*J. Crim. Law*, 32: 3-14, May-June, 1941), speaking from a long life spent in the study of legal psychiatry, pleads for special training in this field (cf. Roche, *Penn. Bar Assn. Quarterly*, 12: 161-168, April 1941) for expert witnesses and for law students. Allen (*J. Crim. Law*, 32: 196-199, May-June 1941) and Hughes (*Ment. Hyg.*, 25: 76-86, Jan. 1941) discuss the Minnesota law providing for the commitment of

"sexual psychopaths"; a new and significant advance in legal concepts. Guttmacher contributes a succinct and authoritative review to *Med. Clinics of North America* (25: 313-329, Mar. 1941). Parker (*Cornell Law Quart.*, 26: 375-425, Apr. 1941) presents a thesis on the determination of insanity in criminal cases which is of especial interest as written for a law degree by an experienced psychiatrist. Primarily a study of the Desmond law of New York, it presents the historical background and discusses the procedure of other states.

The *Journal of Criminal Psychopathology* continues to present many articles of interest in this field. The reader is referred to the files of that journal for further details. Among the articles of general interest may be mentioned: A review of the evolution and development of the concept of psychopathy and psycho-personality by Mauchs (2: 329-356; 2: 465-499); a study of the classification and treatment of sex offenders and offenses by Wile (3: 11-31); and an investigation of the rôle of alcoholism in the history of criminals by Moore and Gray (3: 289-325).

#### GENERAL CLINICAL PSYCHIATRY

By NOLAN D. C. LEWIS, M.D., NEW YORK, N. Y.

The studies in clinical psychiatry reported during 1941 include a fairly wide range of topics with the principal interests in early manifestations of schizophrenia, catatonia, depressions, various types of hallucinations, mechanisms of delusions and in some features of diagnosis and prognosis.

Owing to world conditions there has been a reduction in the amount of clinical psychiatric research. The published output is 50 per cent less than the previous year; moreover, much that is now written in the foreign journals is not available to American readers. As in the past 10 years, the pharmacological shock therapies and associated activities dominate the field of psychiatric research, and many problems in clinical psychiatry have grown out of these new treatment programs, all of which are mentioned in other sections of this review.

An attempt to formulate a new classification of personality qualities has been made by Ichheiser. These qualities are grouped as *real*, *pseudo* and *sham* (*Char. and Personality*, 9: 218, 1941). According to this author the real qualities are those which belong to the immediate equipment of personality and which exist independently of the individual's situation. The sham qualities are attributed to an individual only from the viewpoint of others; they are not inherent in him. The pseudo qualities are those correlated with certain social situations; they are "lent" on the part of society but disappear when the situational component is exhausted—they are borrowed qualities. The human personality is as it is, not only because of these three qualities, but also because their existence is ignored.

Zehnder from a study of the clinical pic-

ture and course of illness in schizophrenic siblings in 38 families with a total of 92 patients (*Monatsschr. für Psychiatrie u. Neurologie*, 103: 231, 1941) discovered that when the content of the psychoses is dissimilar in siblings, it may be explained by differences in environmental factors and life experiences which vary in so many features even in those who are brought up under the same general circumstances. Why schizophrenia in one sibling may be periodic in type, and in another leads quickly to deterioration, and in still others is characterized by catatonic or paranoid manifestations, is more difficult to explain. However, Zehnder made the interesting observation that when the illnesses had their onset at ages not far apart, the clinical pictures were more frequently similar and the psychosis followed a similar course, while if siblings fall ill in different decades of life, there is a greater incidence of divergence in types and course of the schizophrenia.

The survey of the population of a mental hospital by Hemphill and Stengel revealed an apparent lack of special psychotic reactions in schizophrenics to physical illnesses. (*J. Ment. Sci.*, 86: 790, 1940). They seem to react to bodily illnesses either in the same manner as normal people, or, more frequently in an indifferent way. However, these authors have found cases in which there were marked mental reactions of a definite type, and in their discussion they outline the particular mechanisms involved in a way that requires reading in the original to be comprehended.

The catatonic process has been studied by Sprague and a "force concept" formulated (*Psychiat. Quart.*, 15: 327, 1941). The catatonic process is seen "When an individual develops some notion of a force or power whose nature is not well understood, yet with which he senses some disruption of his personality integration; a considerable regression may occur leading to a partial or complete preoccupation with forces and powers as such. This is catatonia, which, focusing upon power apart from its ordinary practical associative connections, may be evidenced in varying mixtures of muscular and ideational symptomatology."

From an analysis of the literature on

neurological conceptions relative to visual hallucinations and from a thorough study of 16 cases of tumor involving only the optic nerves or chiasm, Weinberger and Grant of Philadelphia (*Arch. Ophthal.*, 23: 166, 1940) present evidence at variance with preceding ideas on the subject. The neuro-optical mechanisms are well described in their several relationships, and it is pointed out that visual hallucinations alone have no localizing value in diagnosis. They appear to be highly complex psychological phenomena mobilized by sensory excitations arising from any portion of the neural apparatus of the visual system. The psychological mechanisms involved represent the total integrative activity of the mind which includes memory experiences, emotions, degrees of sensitivity, constitutional factors and the intellectual endowments which vary considerably among individuals. Depending on these and other factors including the degree of development of the constitutional factor of natural imagery, the hallucinatory experiences will be simple and crude or elaborate, rich and complex in type.

An interesting account of the effect of the drug "marihuana," which is an extract of the hemp plant, an annual of the genus cannabis, has been given by Professor Adams of the University of Illinois (*Science*, 92: 115, 1940). As to its psychological effect, there are several successive phases expressing intoxication, although in general it weakens the will and interferes with logical thinking. First there is a feeling of strength and of well being, followed by some fugacity of ideas, exaggerated emotions and irresistible laughter; pressure of speech and gradually incoherence obtains with blurring of the elements of environment. The confusion increases, time appears slow in passing, perception is distorted, but sight and hearing are acute, and the subject is in a state of increased suggestibility. This is followed by a deep sleep. The subject usually remembers his experiences. During the course of the intoxication such unpleasant symptoms as pain, fears of death and destructive tendencies may appear. Excessive indulgence may lead to chronic headaches, loss of resistance to fatigue, interference with work adjustments and other evidence of physical and

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mental disturbance. Withdrawal of the drug from habitual use apparently is not usually followed by the unpleasant phenomena released by privation of morphine and some other drugs.

Sydenstricker and Cleckley (*Am. J. Psychiat.*, 98:83, 1941) reported that patients in stuporous states or in active psychoses and without clinical symptoms of pellagra or other deficiencies, reacted promptly and favorably under treatment with nicotinic acid. They believe it is indicated in cases of clouding of consciousness of unknown origin.

The progress of psychosomatic medicine in its various practical applications, research aspects and theoretical trends has been well reviewed by Notkin (*Journ. Nerv. and Ment. Dis.*, 94: 539, 1941) but a few special reports may be mentioned. Doty (*New York State J. Med.*, p. 1723, 1941) states that psychosomatic problems in medicine may be classified into three groups, (1) those in which the personality disorder resembles a somatic disease in its expressions, (2) those in which somatic disease is present, but is not taken into account because of a more prominent co-existing personality disorder, and (3) those in which the somatic disease is so prominent that the contributing personality factors are concealed or in the background. Therefore all physicians should be on the alert for these combinations and attempt to evaluate all possible factors.

Personality disorders playing an active rôle in digestive complaints have been emphasized by Robinson in a clinical study (*Bull. J. Hop. Hosp.*, 68: 203, 1941). Thirty-eight of 50 patients admitted consecutively to the G. I. clinic of the Johns Hopkins Hospital Dispensary were found to have personality disorders of which digestive complaints were principal symptoms—in most cases without organic lesions. Twenty-three of these patients were treated favorably by a simple form of psychotherapy given by an internist without special training in psychiatry. This favorable group consisted of those with "situational neuroses" who were conscious of their problems, able to relate them and to accept guidance and encouragement for adjustment. Four patients with general nervousness and 3 with hysterical reactions showed no lasting improvement of digestive

complaints. The point is discussed as to when a psychiatrist should be consulted, the author stating that the study and treatment of personality disorders in patients with digestive complaints is to be considered as preventive medicine. "Personality disorders were discovered because the patients sought relief for their digestive complaints, and it was these disorders, rather than diseases of the digestive tract, that were of primary importance both from the diagnostic and from the therapeutic viewpoint in a large majority of the cases."

In the field of essential hypertension, Riemer (*Psychiat. Quart.*, 15: 284, 1941) has pointed out that various psychoses may be manifested by the hypertensive psychotic with conflicts on narcissistic bases. Exhibitionism, slow gait, restrained facial expression and defective sexual life are usually present; evident also are feelings of guilt, hostility, passivity and strongly suppressed anxiety. These patients fall into two groups—one which puts up periodic defense to prevent the recurrence of such influences as may cause anxiety and hostility during which period the hypertension subsides; the other which suppresses hostility or anxiety and the hypertension does not subside. The faculty for thought is diminished in these patients and somatic expression is sought through the cardiovascular system.

The effect of emotions upon the function of the diaphragm was observed by Faulkner in 5 patients (*Psychosomatic Med.*, 3: 187, 1941). Alterations in diaphragmatic movement were observed in response to imaginary situations involving strong emotions. Pleasant stimuli brought about increased amplitude in diaphragmatic movement; unpleasant stimuli restricted it. He believes that this action of the diaphragm upon that section of the esophagus which it encircles, may bring about a closure from which cardiospasm results.

Neuroses associated with bronchial asthma were investigated by Schatia. The Rorschach test was utilized as an adjunct to the psychiatric examinations (*Psychosomatic Med.*, 3: 157, 1941). Forty patients with bronchial asthma were analyzed and psychoanalytic findings were confirmed in that it was shown that asthmatics tend to have compulsive per-

sonalities without outward evidence of compulsions or phobias. Twenty-five of the 40 cases presented a sufficient number of signs to indicate a diagnosis of psychoneurosis. After eliminating mental defectives and organic brain disease only 3 of the entire group remained who might have been considered clinically free of neurosis or neurotic character traits.

The Rorschach test is growing in popularity as a useful method in psychiatric diagnosis and Hertz (*Am. J. Orthopsychiat.*, 11: 512, 1941) has recently suggested that a combination of qualitative and quantitative techniques is desirable as its validity as a diagnostic instrument has been established, inasmuch as the method can differentiate reliably various normal groups with different dominant personality traits and various types of mental disorders.

A. A. Weil (*J. Maine Med. Assn.*, 32: 35, 1941) has applied the Rorschach test in the diagnosis of psychoses and psychoneuroses and points out that it enables the examiner to discover the basic plan of the psychic structure of the personality; to recognize the fundamental affective and cognitive organization of the person's mental life; to determine his intelligence, his richness of psychic experience, his present mood, his intuition, his talent, and a great deal about the mental disorder.

The evaluation of the importance of the Rorschach test is just beginning, and it is prophesied that many discoveries will be made by its use in the hands of experts.

Some uses of the Rorschach method in child guidance clinics (*Am. J. Orthopsychiat.*, 11: 503, 1941) have been published. They include:

(1) To determine whether psychiatric or social examinations are necessary in reference to the child's adjustment in the classroom

(2) For differential diagnosis

(3) To assist in the determination of intellectual status when psychometric tests are inconclusive

(4) To determine those children with best prognosis with reference to psychiatric treatment

(5) To determine treatability of parents of children

(6) To determine the status of a case at any given time with the idea of advisability or inadvisability of continued treatment

Other uses such as guides to types of treatment and indicators for vocational guidance and of phobias, anxieties and sex disturbances are listed. The Rorschach is apparently innocuous and evokes less resistance than a psychiatric examination.

According to Kelley and Barrera (*Am. J. Ment. Def.*, 45: 401, 1941) the Rorschach method is important not only in measuring the intellectual ability of the mentally defective, but also in making possible an estimation of the influence of the emotional life on the development (inhibition and stimulation) of intellectual functions. It may also indicate the course to follow in clinical care and suggest the prognosis.

Katz of Basel has made Rorschach studies on insulin-treated schizophrenics (*Monatsschr. f. Psychiat.*, 104: 15, 1941). Her work was carried out on 149 Rorschach records in a total of 113 treated schizophrenic patients. In a large majority of cases the Rorschach findings corresponded to the clinical situation. However, the reactions suggest that the "complete" remission in the successful cases does not constitute a complete restitution, since schizophrenic traits were still present and in this sense is not different from a "spontaneous recovery." No ultimate prognosis could be determined from the Rorschach examinations.

The author listed ten reactions suitable for statistical evaluations. These are (1) numerous rare detail responses, (2) great frequency of space responses; (3) poor form control, (4) variations in quality of interpretations, (5) high incidence of color responses, (6) numerous and unusual anatomic responses, (7) abstract interpretations, (8) replies with a delusional content or import, (9) numerous original responses of poor form and (10) failure to respond to a number of the cards. Remnants and "shadows" of delusions are often detected by the Rorschach in patients who have recovered from the ordinary clinical manifestations of their illness.

Henry administered the Rorschach test to members of a primitive tribe known as the Pilaga Indians in the Argentine (*Am. J.*

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*Orthopsychiat.*, 11:230, 1941) and concluded that more experience with the method in this work would be necessary before it could be of particular value in studying primitive people. He says, "It seems to me that the problems of rapport, strangeness of culture and language, absence of pictorial experience on the part of the subjects, and the necessity for detailed and sensitive case histories make it impossible to think of valid Rorschach results except in terms of a long field trip."

The Kent Oral Emergency and Stanford-Binet tests were given to 70 delinquent adolescent persons by Springer in a comparative

study (*Am. J. Orthopsychiat.*, 11:292, 1941). Differences in the results obtained by the two tests are small, and they both detect a dull normal intelligence. Feeble-minded and borderline individuals are apt to make higher scores on the Kent. Neither test revealed reliable differences in the scores of first offenders and recidivists. The Kent is simple for presentation, is short and no academic subject matter is required. It is inoffensive enough to bring responses from youths with hostile attitudes to ordinary examinations, and it is oral, not containing reading or writing matter which tends to reactivate the school situation.

## BIOCHEMISTRY, ENDOCRINOLOGY AND NEUROPATHOLOGY

By JOHN C. WHITEHORN, A. B., M. D., BALTIMORE, MD.

For a brief review of this year's biochemical contributions in the field of psychiatry, the writer's choice of emphasis is put on two events, first, the publication in this Journal of an A.A.A.S. symposium on "The Internal Environment and Behavior," and, second, the program on "The Role of Nutritional Deficiency in Nervous and Mental Disease," at the 22nd annual meeting of the Association for Research in Nervous and Mental Disease, December 19 and 20, 1941.

Both these events symbolize in a manner the attainment of a certain degree of maturation in these fields of study. It is significant that in both programs an abundance of data has been available for the consideration of a considerable variety and range of *psychobiological functioning* in relation to biochemical conditions. This stands in some contrast to earlier periods, necessarily more primitive in method and content, when biochemical adventurers oriented their rather sporadic psychiatric studies toward the somewhat artificial concepts of the mental disease entities.

McFarland (1) opened the A.A.A.S. symposium with a quotation from Claude Bernard, "It is the fixity of the *milieu interieur* which is the condition of free and independent life. All the vital mechanisms, however varied they may be, have only one object, that of preserving constant the condi-

tions of life in the internal environment." McFarland considered more particularly the limitations of the organism in maintaining its internal supply of oxygen and the effects of anoxia upon the integration and psychological functioning of the organism, as shown in tremors and incoordination, and in failures of memory and of light sensitivity. Experiments of McFarland and his collaborators published in the last two years were cited to point out similarities in the limitation of light sensitivity by oxygen lack and glucose lack. "Dark adaptation appears to be related not only to photo-chemical processes in the retina but oxidation in the nervous tissue plays an important role also." As to suggestions that anoxia may be a primary factor in certain forms of schizophrenia, McFarland stated that convincing evidence to this effect has not been obtained.

Gellhorn (2) reviewed the considerable recent literature on the reactions to hypoglycemia—chiefly in terms of homeostatic reactions demonstrable by the methods of the physiological laboratory rather than in terms of behavioral adjustments. His system of reference is rather highly schematic—association, memory, sensation and perception are referred to the "cortex"; homeostatic reactions are chiefly referred to "sympathetic centers" (medullary and hypothalamic); and "alterations in mood may be

interpreted as a disturbance in the relationship between the cortex and the hypothalamus." This article is notable chiefly for its delineation of the intricate physiological reactions and interactions brought to attention through study of the insulin treatment. In summary, he stated that hypoglycemia leads to a general decrease in "cortical activity," and a state of increased excitability of "sympathetic centers," although the combination of prolonged hypoglycemia and anoxia results in a breakdown of homeostatic regulation.

Adolph(3) discussed the water balance, stating that "elimination of excesses and replacement of shortages are symmetrical aspects of recoveries and adjustments of water content." He lists briefly certain symptoms noted in water excess and others noted in water deficit; and makes this statement: "Diverse types of organic and functional nervous disease are characterized by aberrant rates of adjustment of water content."

Shock(4) in his discussion of acid-base balance came somewhat closer to a potentially significant psychiatric contribution in summarizing the evidence that alkalosis increases excitability, particularly motor excitability, while decreasing auditory and visual sensitivity. After remarking upon the association between anxiety states and hyperventilation, he made the interesting suggestion that the diminished sensitivity of the respiratory center reported in dementia praecox may prove to be nothing more than a persistence of hyperventilation. In his discussion of the "intervals of lucidity" in catatonic schizophrenia induced by the administration of carbon dioxide, Shock questioned whether the "cerebral stimulation" can be attributed to alterations in the acid-base balance. Very sensibly, he referred to the experiments of d'Elseaux and Solomon, indicating the effectiveness of any intense stimulus which the patient regards as a threat to himself.

Richter(5) contributed a review of the brilliant experimental work of his laboratory concerning the behavioral factors, or the responses of the total organism, which contribute to the maintenance of the internal environment. It is indeed this portion of

the symposium which rises most significantly above the level of noting "symptoms," and justifies the behavioral-adjustment theme of the symposium. He cites experiments demonstrating that "the maintenance of a constant internal environment depends not only on physiological factors, but also on behavior factors, responses of the total organism. . . . We saw that rats threatened with dehydration due to the loss of the anti-diuretic hormone from the posterior lobe of the hypophysis maintained a normal internal water balance by drinking large amounts of water; further, that rats threatened with a seriously lowered body temperature following hypophysectomy or thyroidectomy built large nests and thereby conserved their body heat; that rats whose internal salt balance had been disturbed by adrenalectomy drank large amounts of salt solution and thereby kept themselves alive and free from symptoms of insufficiency; that parathyroidectomized rats sought calcium solutions and thus maintained their normal calcium balance; and finally, that pancreatectomized rats, which apparently are unable to utilize carbohydrates, avoided sucrose and ate large amounts of the fat, olive oil, thus freeing themselves from symptoms of diabetes. . . . Further research along these lines must concern itself with situations in which this effort to maintain a constant internal environment fails or breaks down."

The program of the Association for Research in Nervous and Mental Disease will, by the custom of that society, be available in a published volume in 1942(6). Cowgill gave a general view of modern concepts in nutrition. Elvehjem presented with unusual clarity the intricate relationships between the enzyme systems and the vitamins, with particular attention to the roles of the members of the B complex in relation to the enzymes concerned in tissue respiration. Bessey presented results elucidating some of the apparent discrepancies and species-differences of the avitaminoses. His presentation clarified in some measure the differential effects of acute and subacute vitamin deprivation—different degrees of deprivation and need—in different organ systems. Wilder discussed the work of his collaborators in some rather

rigidly managed experiments conducted on cooperative state hospital patients, indicating that in relatively slight deprivation of thiamin there may occur troublesome disturbances of personality functions, such as irritability. Spies, Strauss and Bowman and H. Wortis presented recent findings and points of view regarding the clinical psychiatric and neurological significance of deficiency states. The symposium was noteworthy for the pertinence and high quality of the questions and discussions which were aroused, and the effective participation of many workers in this very active field. The volume containing the complete program will be an invaluable source of stimulation and a guide to further study.

The wave of interest in shock methods of treatment still stimulates biochemical and neuropathological studies. Loman's observations on arterial and venous blood (7) added one more indirect evidence that "neural dysfunction, rather than stimulation of cerebral respiration, may be the important factor which is related to the change in mental states of subjects treated by insulin hypoglycemia."

Finley and Brenner (8) reported upon the histological examination of the brains of monkeys treated with metrazol and insulin.

They stressed the finding that "even in animals which received only 9 insulin comas cortical damage of a permanent character was observed." Arieti (9) examined the kidneys as well as the brains and livers of monkeys after a number of metrazol-induced convulsions and reported that "interstitial and parenchymatous nephritis was always found."

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## ALCOHOLISM, NEUROSYPHILIS, SHOCK THERAPY AND GERIATRICS

BY KARL M. BOWMAN, M. D., SAN FRANCISCO, CAL.

WITH THE ASSISTANCE OF HARRY C. SOLOMON, M. D., BOSTON, MASS., AND JOSEPH WORTIS, M. D., NEW YORK, N. Y.

### ALCOHOLISM

The most important progress in the study of alcoholism has been the formation of The Research Council on Problems of Alcohol, and the publication of a new magazine, the *Quarterly Journal on Studies of Alcohol*. A series of articles reviewing the effects of alcohol on the individual are appearing in this journal. These articles abstract all important contributions since 1911 and will soon appear in book form (Published by Yale University Press).

The treatment of the acute alcoholic psychoses has been somewhat modified. In delirium tremens (1, 2), it is now generally

agreed that more alcohol should not be given. Fluids are no longer restricted. The giving of salt plus forcing fluids prevents the development of cerebral edema; hence fluids should be given as freely as possible (3). There is some disagreement as to the rôle of vitamin deficiency, but most authors agree that delirium tremens is not due to a vitamin deficiency. On the other hand, alcoholic encephalopathy with grasping and sucking reflexes and cog wheel rigidities responds strikingly to nicotinic acid (4). Vitamins, particularly the B complex, should be used in the treatment of delirium tremens, however, to prevent the development of an

alcoholic encephalopathy, since most of these cases are suffering from a generalized vitamin deficiency.

In the treatment of alcohol addiction, interesting articles have appeared. Knight(5) has given an excellent discussion of the psychoanalytic approach. Voeghtlin(6) has reported a special modification of the conditioned reflex method of treatment and claims unusually good results. His work should be checked by others and the possibilities of more extensive use of the method considered. The same may be said of recent reports concerning "Alcoholics Anonymous." Thompson(7), reporting from the Rockland State Hospital, New York, finds that he has obtained better results when enlisting the aid of Alcoholics Anonymous. Further studies along this same line are indicated.

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#### NEUROSYPHILIS

There has been no startling contribution to knowledge in the field of neurosyphilis during 1941. There has been rather general agreement that the combination of fever treatment and chemotherapy—including under the latter, tryparsamide and trivalent arsenic—is the most efficient procedure in malignant forms of the disease.

Much consideration has been given to methodology and technique, but no unity of opinion has crystallized as to the relative value of the different methods of inducing fever. Some therapists prefer malaria; others, mechanically-induced fever; and a few prefer typhoid vaccine fevers. As to the optimum height and number of mechanically induced fevers no agreement has been reached, but most users of the method tend

to rely on less long-sustained temperatures than formerly; namely, two or three hours at a temperature of 105 to 106 degrees.

Emphasis has been laid on the advantage of long courses of malarial fever, even more than 30 paroxysms. This is by no means a generally accepted procedure, and its therapeutic value has not been definitely established.

It has been shown that thiobismol, given during malarial fever, reduces the frequency of the paroxysms, changing the rhythm from the usual diurnal one to a tertian type, and at the same time often reducing the height of the temperature.

Electroencephalographic studies indicate that abnormal or borderline tracings are found in the majority of cases of all types of neurosyphilis, the abnormal tracings being as common in tabes and optic atrophy as in general paresis, although no characteristic type of abnormal pattern is found for neurosyphilis in general, or any type thereof. In cases of general paresis, the more severe the clinical picture, the more abnormal is the electroencephalographic pattern. The untreated cases of neurosyphilis show a higher percentage of abnormal tracings than do the treated cases. The majority of treated cases of general paresis, showing an improved clinical state, show a corresponding improvement in the electroencephalographic patterns.

#### SHOCK THERAPY

Since the revival of interest in heroic therapeutic procedures marked by the introduction of the insulin treatment, a succession of more or less similar procedures have been sponsored in various quarters. In the past few years alone fever, freezing (1), phlebotomy, fasting, fattening, stimulating, quieting, analyzing, oxygen deprivation (2), medication with thyroid (3) and a great variety of other endocrine preparations, as well as prefrontal lobotomy (4), have all been recommended for treatment of the psychoses. It is typical for the present state of therapeutic uncertainty that benzedrine and insulin, almost classical physiological antagonists, are both being widely used in the treatment of depressions. Empiricism has undoubtedly led to considerable random movement and to some excesses. At present

<sup>1</sup> Cannot be of much

only two fundamental methods have held their own beside the ordinary armamentarium of psychotherapeutic procedures: convulsive treatment and insulin treatment. The method of inducing convulsions by brief faradic stimulation has superceded all other convulsive techniques (5, 6, 7, 8, 9). Insulin is being effectively used both with (10) or without supplementary glucose to induce more or less intensive hypoglycemia and coma. The indications regulating the choice of therapeutic procedures remain somewhat vague, but the following general points of guidance have won some measure of acceptance in the current literature:

The scope of the shock treatments is encompassed by the so-called functional psychoses, not the psychoneuroses. In spite of a great deal of misleading neuropathologic study of the brains of animals killed with metrazol or insulin, electrocuted, or subjected to procedures far harsher than human patients need ever encounter, it must be recognized that the treatments are far from innocuous.<sup>1</sup> Convulsive treatment is more drastic than insulin and is probably more likely to produce brain damage (11, 12): its chief field of usefulness is in the manic-depressive psychoses and in involutional depression. It is especially suitable for the ambulatory (13) treatment of endogenous depressions, since less than ten treatments generally suffice. The best preventives for the typical compression fractures of the dorsal spine are hyperextension and minimal restraint (14). Subconvulsive treatments also appear to be of some value (15, 16). Insulin without deep hypoglycemia or coma is useful in acute alcoholism (17) and the "toxic" alcoholism (18) of the chronic drinker. It can be employed advantageously in endogenous depressions where other procedures are contraindicated. The orthodox insulin shock treatment of Sakel's is still the treatment of choice in schizophrenia. Its most typical complication, irreversible coma (19, 20), is due to overprolongation of coma, and should be treated, when it occurs, by blood transfusion. During insulin treatment auxiliary

vitamin medication, particularly of the B complex (21, 22, 23), is often useful.

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<sup>1</sup> Curare, erythroidin or similar substances should not be used with electric shock for the prevention of fractures as the degree of respiratory failure is much greater than when metrazol shock is used.

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#### GERIATRICS

In May 1941, a two day meeting on gerontology was held in Washington. The papers from this meeting are to appear in book form and should make a valuable contribution to the subject.

Since it has been shown that the incidence of mental disease increases with each decade

and since the number of old persons in our population has increased enormously in the last two decades; it is obvious that more attention must be paid to mental disease in the aged. Also the increase of our urban population results in an increase of admissions to state hospitals since many mild cases can get along in rural communities but cannot be safely kept at home when living in cities. Senile dementia and cerebral arteriosclerosis are the two most important types. Although textbooks carefully differentiate these two disorders, the clinical pictures are not as easy to distinguish as is often claimed. Recent neuropathological studies show very little correlation between the type and severity of symptoms and the amount and location of brain lesions.

No startling advances have been made in prevention or treatment. Endocrine preparations and vitamins have been tried quite extensively. While they may have great value in a few selected cases, it does not seem that any general solution to the problem has been attained by their use.

#### ELECTROPHYSIOLOGY AND EPILEPSY

By WILLIAM G. LENNOX, M. D., BOSTON, MASS.

The surge of discovery in the field of electrophysiology and of epilepsy is comparable to the productive activity which attended the development of neuropathology in the last century. The mere listing of the articles which have appeared during the past 12 months would consume the available space of this review. Fortunately, 1941 saw the birth of three books which cover the clinical aspects of the subjects under discussion. An *Atlas of Electroencephalography*(1) contains not only life-sized electrical tracings, but also a full discussion of electroencephalography and some 600 references to the subject. *Epilepsy and Cerebral Localization*(2) is a fine contribution to the problem of the place of origin and the pathway of spread of jacksonian or focal seizures. The pathology, electroencephalography and surgical treatment of traumatic epilepsy is dealt with in detail. *Science and Seizures, or New Light on Epilepsy and Migraine*(3) covers the field of essential epilepsy for the practi-

titioner of medicine and the intelligent layman. In addition, the world's literature on epilepsy was abstracted last year, as it is each year, in the journal *Epilepsia*(4). On the assumption that the reader has access to these sources, the reviewer will confine himself to a few very recent events.

Disasters of 1941 include the deaths of Hans Berger, originator of electroencephalography, and of Dusser de Barenne, a foremost applier of this technique to the study of the finer anatomy and the function of the brain.

#### ELECTROPHYSIOLOGY

The electroencephalogram offers a wonderful opportunity to study the essential activity of the brain, to join cortical discharges with cortical metabolism and analyze their joint mechanism. Studies of this nature begun a few years ago(5, 6) need to be confirmed and amplified. The importance of

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glucose, electrolytes, pH, CO<sub>2</sub> has been well recognized. Now it appears that chemical substances which mediate the spread of nervous impulses across the neuromyal junction may also be influential in the central nervous system. Application of acetylcholine to the cortex of animals produces dysrhythmia not unlike that seen in epileptics(7). Freezing the cortex(8) or placing a foreign body under the dura(9) causes abnormal waves to appear.

Priority of space must be given to clinical applications of the electroencephalogram. In the last year—or half dozen years—little has been added to the earlier surmises concerning the origin of the spontaneous pulsations of the human brain. Apparently in only two instances has the attempt been made to record the subcortical dysrhythmia of patients by means of deeply placed electrodes. The effect on the electroencephalogram of changes in brain metabolism and circulation is important. The slowing of rhythm as a consequence of hyperpnea, so prominent in childhood, tends to diminish with age(10). In adults these large slow waves when they occur reflect the inability of the brain to protect itself against lowered CO<sub>2</sub> tension by means of cerebral vasoconstriction(11), though the opposite hypothesis, that anoxemia as a result of vasoconstriction causes the slowing, has also been advanced(12). Reduction of atmospheric pressure in a chamber to simulate high altitude flying has little effect on brain waves(13), whereas acute decrease in O<sub>2</sub> tension to unconsciousness slows the brain waves. The addition of 5 per cent CO<sub>2</sub> restores both the waves and consciousness(14), an observation of obvious importance to aviation.

Agreement among workers has not "jelled" over classifications of records, terminologies to be used or criteria of the "normal" tracing. Persons who are "normal" in mind and action may have very unusual brain waves. Determination of the proportion of persons with waves of unusual frequency or voltage in different samples of the population is of prime importance. In such a survey, factors such as the age of the subject, history of previous brain injury, or a family history of cerebral dysrhythmia must be weighed. One laboratory which has

made records of approximately 1500 "normal" persons and many thousands of patients found that dysrhythmia was present in 10 to 15 per cent of certain selected groups, viz., private school boys, medical students, aviators and those draftees who had no significant personal or family history. The incidence of dysrhythmia ran about 30 per cent in behavior problem children, about 40 per cent in draftees with a history of head injury, crime, queer behavior, etc., about 50 per cent in relatives of epileptics and about 95 per cent in epileptics themselves(15). The findings of other investigators working with the same material would perhaps differ widely from these figures. In England, dysrhythmia among army flyers was reported as only 3 per cent(16). Among groups of men preparing for war service, the process of elimination by means of histories and ordinary physical examinations reduces the proportion of men who have cerebral dysrhythmia. Obviously portions of the population studied should include not only normal and abnormal groups, but also the supernormal. Private school boys who do not adjust well tend to have unusually slow waves, whereas those who rate high in personality and accomplishment tend to have unusually fast waves(17).

When a person with some disorder of the central nervous system has an unusual electroencephalogram, the important question arises whether the dysrhythmia is a result or a cause of the clinical disorder or, possibly, is not related to it. If antecedent to the disorder, was the dysrhythmia a constitutional characteristic of the individual, or was it the result of improper development of the brain or of some injury to it? A study of 53 normal twins, both monozygotic and dizygotic, indicates that brain waves are a hereditary trait, although of course readily modified by environmental factors, such as injury to the brain or acute disturbances in its physiology and function(18). Adult twins who have lived apart many years and have "grown apart" in tastes and interests may yet have identical brain waves.

Electroencephalography will in time permit a new and more fundamental classification of disorders of the central nervous system. Only some of the more common complaints

have been studied. An undue proportion of schizophrenic patients have dysrhythmia. One investigator found dysrhythmia in 8 per cent of 300 "normals" and in 30 per cent of 500 schizophrenics, yet these patients had no characteristic pattern(19). Another author, using a frequency analyzer, stresses the importance of waves faster than twelve per second(20). Manic-depressive cases of the manic type tend to have fast waves, and confused patients of any type have very slow waves(21). After metrazol shock therapy a proportion of patients have a continuing dysrhythmia, presumably an expression of brain injury(22, 23).

Additional reports have come in of the frequency of dysrhythmia among "behavior problem" children(24, 25). Strangely, little has been said about corresponding disorders in adults. Presumably prisons harbor many persons afflicted not with moral turpitude but with disordered brain waves which require chemical therapy, or, for the protection of society, eugenic prophylaxis. A correlation between the prominence of the normal ten a second waves and various attributes of mind and personality has been attempted(26) but requires larger material. Continuing studies support previous claims of the value of the electroencephalogram in the localization of cortical injuries(27), in confirming focal seizures(28) and in judging the prognosis of patients with traumatic injuries(16).

### EPILEPSY

Electrical studies have played fairy godmother to Cinderella epilepsy. The ages-long controversy over the influence of heredity and the meaning of "essential" and "symptomatic" has been resolved, at least in the opinion of some workers. Although only 2.5 per cent of the near relatives of epileptics have epilepsy, about 50 per cent have cortical dysrhythmia, and in four-fifths of the families at least one of the parents has definitely abnormal brain waves. A potent argument against the importance of heredity has been instances of epilepsy in only one member of a pair of identical twins. Seven such twins were examined electrically. In each case the normal twin had dysrhythmia, and in all but one or two cases the epileptic twin had evidence of early brain injury(18). These

findings support the view that epilepsy, the plant, is not inherited, but dysrhythmia, the seed of epilepsy or an allied disorder, may be inherited.

As indicated early in this review, there may be chemical mediation of the discharge as well as of the conduction of nerve impulses, a fact which might have implications for epilepsy. The administration of acetylcholine seems to make the alternate wave and spike potentials of petit mal worse and atropine to make them better(29). Patients with petit mal seem to carry a lowered concentration of CO<sub>2</sub> in their arterial blood, and their brains tend to have a lowered respiratory quotient and to burn an unusually small amount of glucose per unit of oxygen(30). Means for more accurate study of the metabolism of the brain in both symptomatic and asymptomatic dysrhythmia have by no means been exhausted. The laboratory of war has demonstrated that fright occasioned by bombings does not increase the frequency of seizures among epileptics(31). Dilantin sodium (phenytoin sodium) continues to prove its effectiveness in controlling many seizures which previously had not been controlled, but a watch must be kept for long term effects of the drug. Chemical explanation of the beneficial effects of this and other anticonvulsant drugs has not been given, in spite of useful speculation(32) and preliminary studies(33). Present methods of studying brain metabolism in the human subject should permit a testing of the longstanding view that barbiturates act by causing an inhibition of the oxidation of brain glucose. Reports of seemingly illogical treatments, such as administration of germ-killing substances(34) or the induction of convulsions by electrical shock(35) must be examined without prejudice. Starvation of a few epileptics by an osteopath twenty years ago led to the present greatly improved outlook for multitudes of patients.

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## CHILD PSYCHIATRY. MENTAL DEFICIENCY

By LEO KANNER, M.D., BALTIMORE, MD.

Child psychiatry, in 1941, has continued to consolidate its position through a number of important events: the establishment of

new child guidance clinics; the completion of arrangements for others to be launched in 1942; a resolution to change the scope and

name of the American Psychiatric Association's Section on Mental Deficiency to a Section on Child Psychiatry; active participation of the United States Public Health Service in the organization of State mental hygiene units; and increasing collaboration between pediatricians and psychiatrists. A list of "Current Pediatric Literature," edited by McCulloch,<sup>1</sup> contains one journal, *Mental Hygiene*, and 16 books on child development, child psychology and psychiatry, and parent education among those "considered indispensable for individual ownership and reading, which should be in every pediatrician's personal library."

Periodical literature has been enriched by a new journal, *The Nervous Child*,<sup>2</sup> edited by Ernest Harms with the aid of several leading psychiatrists and psychologists. The first issue, which contains five authoritative articles and extensive bibliographic reviews, appeared in the autumn. The editor's announcement says: "This journal is founded in recognition of a need for a new forum for publication and discussion of reports concerning the problems of the 'nervous and mental diseases' of children. The editorial board is composed of representatives of the various schools of thought in this field."

*Popular books and magazine articles* on topics pertaining or related to child psychiatry continued to stream from the press. The general tone of the writings for public consumption is getting away from the lamentable habit of alarming the laity. Earnest workers no longer consider it below their dignity to contribute to parent education in a calm, nonscaring and even unscaring manner. Within the past year, several such books became available to parents, among them *Children in the Family* by Powdemaker & Grimes,<sup>3</sup> *In Defense of Children* by Beverly,<sup>4</sup> *In Defense of Mothers* by Kanner,<sup>5</sup> *The Parents' Manual* by Mrs. Wolf,<sup>6</sup> and *Feeding Our Old-Fashioned Children* by C. & M. Aldrich.<sup>7</sup>

Another general presentation, *The Doctor*

<sup>1</sup> C. V. Mosby Co., St. Louis.

<sup>2</sup> The Philosophical Library, New York.

<sup>3</sup> Farrar & Rinehart, New York.

<sup>4</sup> John Day Co., New York.

<sup>5</sup> Dodd, Mead & Co., New York.

<sup>6</sup> Simon & Schuster, New York.

<sup>7</sup> Macmillan Co., New York.

*and the Difficult Child* by Moodie,<sup>8</sup> though published a few months before 1941, should not be omitted because it is the latest and clearest account of the nature and treatment of early behavior disorders, written for pediatricians and general practitioners as well as for the intelligent layman.

Bradley's book, *Schizophrenia in Childhood*,<sup>9</sup> derives its significance from the author's successful attempt to bring our knowledge of the subject up to date. It is a well-organized combination of historical synopsis, "reader's digest," and original case contributions. Childhood schizophrenia is considered "as a rare but severe distortion of the personality, peculiarly distinguished by a diffuse retraction of interest from the environment."

In practically all centers considerable attention was paid to *play investigation and play therapy* of emotional difficulties. Three comprehensive reviews (Kanner,<sup>10</sup> Newell,<sup>11</sup> Bender and Wolmann<sup>12</sup>) indicate that play methods have become helpful and widely employed tools in psychiatric work with children. They also show that existing differences in methodology bear close relation to the intrinsic personality features of the individual therapists. This realization has tended to put greater emphasis on a search for common ground than on perpetuation of controversy. A round table conference on play techniques at the Richmond meeting of the A.P.A. served to bring some of the principal workers together for a discussion of their views, which differed widely, and their experiences, which showed remarkable similarity.

From the point of view of what is now spoken of as psychosomatic medicine, Bruch<sup>13</sup> has studied on a broad basis and reported the personality development and family relationships of children tending to overeating and obesity.

A new program, intended to aid the several states in the establishment of mental hygiene and child guidance units, has been inaugu-

<sup>8</sup> Commonwealth Fund, New York.

<sup>9</sup> Macmillan Co., New York.

<sup>10</sup> J. Pediatrics, 17: 533.

<sup>11</sup> Am. J. Orthopsych., 11: 245.

<sup>12</sup> The nervous child, 1: 17.

<sup>13</sup> Am. J. Orthopsych., 11, 467. J. Pediatrics, 19,

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rated by the United States Public Health Service. Promising young psychiatrists are selected for a course of training in public hygiene and child psychiatry, with the view of becoming the heads of such units. The first incumbents have begun their preparation last fall, by arrangement with the Johns Hopkins School of Hygiene and Public Health and with the child guidance facilities of Baltimore.

The present emergency has had two noticeable effects in relation to child psychiatry. Calls to the armed services have created vacancies in child guidance clinics, which are not easy to fill. The present and future repercussions on the mental hygiene of childhood have become a topic of discussion in psychiatric literature. *Borrowed Children* by Mrs. Strachey<sup>14</sup> offers a valuable "popular account of some evacuation problems and their remedies" in England. (An article by Thomas in the October 1941 issue of *Mental Hygiene* deals more specifically with problems of the evacuation of intellectually retarded children.)

The study of mental deficiency has, at least on this Continent, continued its progressive trend toward humanization of its interests. The *American Journal of Mental Deficiency*, under the able editorship of E. J. Humphreys, is rapidly becoming one of the country's leading vehicles of psychobiologic thought. Research centers, though still few in number, have maintained their high standards of productivity.<sup>15</sup>

Much thought was again given last year to the problems of the social control of the feeble-minded as a coordinated community, state and national responsibility. Both intramural and public school educational possibilities and methods were studied. The Committee on Education and Training of the American Association on Mental Deficiency, in collaboration with the United States Office of Education, has just issued a "Survey of Educational Programs in Residential Schools for the Mental Deficient." Abel's study of moral judgment among subnormals,<sup>16</sup> based on methods evolved by Piaget, stresses the value of training in this direction with the

aim of preparing state school patients for return to the community.

Among the more specific research items, one might mention the work by Strauss and Werner on differences in mental structure between the brain-injured and "endogenous" types of mental defectives (work which has already contributed much to a dissipation of the illusion of the homogeneity of the feeble-minded)<sup>17</sup>; studies concerning microcephaly (Benda<sup>18</sup>), lead encephalopathy (Kavalloff<sup>19</sup>), measles encephalitis (Hamilton and Hanna<sup>20</sup>), juvenile and infantile amaurotic idiocy (Jervis<sup>21</sup>; Rothstein and Welt<sup>22</sup>), and the question, answered negatively, of genetic relationship between schizophrenia and mental deficiency (Kallmann *et al.*<sup>23</sup>).

It is very significant that those most active and productive in the field still have an urge to define and redefine the whole concept of mental deficiency. The October issue of the *American Journal of Mental Deficiency* contains not less than three such attempts, by Yepsen, Kuhlmann, and Doll. This need for clarification, grouping and regrouping, broadening or delimitation as practical necessity or advancement of knowledge may dictate, is a wholesome sign of dynamic development. It is a repetition, in one particular psychiatric subdivision, of a trend which for the past half century has proved to be highly constructive in the shaping of modern psychiatry in general.

Equally wholesome is the progressive integration of the study of mental deficiency with the other branches of psychiatry and general medicine, psychology, sociology, anthropology, genetics and education. The year 1941 has brought ample evidence of this integration.

Books, such as *From Cretin to Genius* by Voronoff,<sup>24</sup> are now fortunately not often successful in finding a publisher; this book is of interest mainly as an atavistic mixture of mysticism and gullible misrepresentation contributing to the befuddlement of the lay public.

<sup>14</sup> Commonwealth Fund, New York.

<sup>15</sup> For much of this material I am indebted to Dr. Humphreys and members of the editorial board of the *American Journal of Mental Deficiency*.

<sup>16</sup> J. Abn. & Soc. Psychol., 36: 378.

<sup>17</sup> Am. J. Psychiat., 97, 1194. Am. J. Ment. Def., 45: 548. J. Abn. & Soc. Psychol., 36: 236.

<sup>18</sup> Am. J. Psychiat., 97, 1135.

<sup>19</sup> Am. J. Dis. Children, 61, 547.

<sup>20</sup> Ibid., 61: 483.

<sup>21</sup> Ibid., 61: 327.

<sup>22</sup> Ibid., 62: 801.

<sup>23</sup> Am. J. Ment. Def., 45: 514.

<sup>24</sup> Alliance Book Corporation, New York.

## EXTRAMURAL CARE. HEREDITY AND GENETICS

By AARON J. ROSANOFF, M.D., SACRAMENTO, CAL.

## EXTRAMURAL CARE OF MENTAL PATIENTS

Perhaps the most significant recent development in extramural care of mental patients has been a liberalization and extension of the parole policy of mental hospitals for the relief of their chronic state of overcrowding. There has been a gradual trend in that direction generally in evidence throughout the country for several decades.

The full possibilities of that development have not been attained as yet anywhere. A systematic and intensive effort in this field was undertaken in California in January, 1939; has been pursued on a progressively and uninterruptedly increasing scale since then, and is still under way. This review will be devoted mainly to the California experience and achievement in extension of extramural care.

The State of California has seven mental hospitals with a population (as of Sept. 30, 1941) of 23,491 patients. The story of overcrowding of these hospitals over a period of many years is similar to that of other states and of the country as a whole. Thus during the 10-year period from July 1, 1928 to June 30, 1938, the population of the hospitals increased from 13,797 to 21,884, *i.e.*, by 8,087, or an annual average of 809. The institutions were chronically overcrowded during this period, despite the expenditure of legislative appropriations of an average of \$3,200,000 per biennium for major construction.

In the early part of 1939, *i.e.*, at the beginning of the Olson Administration, the writer, the then newly-appointed Director of Institutions, proposed, in addition to a continuance of the construction program, as measures for a more effective attack on the problem of overcrowding, a twofold program:

(a) The construction of two acute neuro-psychiatric units, each of 100-bed capacity, with provision of large outpatient departments—one for each of the two metropolitan areas, the bay area in the north and the Los Angeles area in the south, whence the bulk of all hospital admissions are received. These

were to serve as centers of preventive work, reducing the stream of admissions to the mental hospitals; also providing timely treatment in cases of recent onset.

(b) An extension of extramural care with the aid of an enlarged social service department.

The first feature of this twofold program is now partly under way. The Langley Porter Clinic is under construction in San Francisco on the campus of the Medical School of the University of California, and is expected to be ready for the reception of patients some time in 1942.

The second feature—extension of extramural care—has attained considerable development.

It is usually assumed that, whether a mental patient may be released from the hospital or is to be further detained therein for care and custody depends mainly or entirely on his condition. This is a fallacy which has resulted in untold injustice and harm all around ever since mental hospitals have existed. The patient's condition is of course a factor in the situation; but, for the most part, the question of release for extramural care is a matter of administrative policy and facilities for psychiatric social service.

During the 1939 session of the Legislature, with the approval of Governor Olson, the Department of Institutions obtained an appropriation of \$100,000 for the forthcoming biennium for additional personnel for psychiatric social work in connection with our program of extension of extramural care. During the 1941 session of the Legislature the Department obtained a further appropriation of \$315,000 for the financing of family care at \$25 per month, for patients suitable for such care, but for whom no other source of financing was available.

The adoption of a policy of extension of extramural care in the seven state hospitals in California at the very outset of the Olson administration in January, 1939, involving an early and rapid enlargement of psychiatric social work personnel, included the appoint-

ment of a Supervisor of Extramural Care with headquarters in the office of the Department at Sacramento and has led, at the date of this writing (October, 1941), to the following results: (a) Total number of patients in extramural care increased from 2,976 to 5,180—the latter number including 485 patients in the category of industrial parole and 197 in family care. (b) The social work personnel has been increased from a total of 8 to 36. (c) The actual resident population of the hospitals increased from 22,086 to 23,491, *i.e.*, by 1,415. This represents an annual increase at the average rate of 510. In the preceding 10 years the population increase was at an average annual rate of 809. (d) The extension of extramural care has resulted in benefits to the patients and economies to the State. A considerable reduction of overcrowding in the hospitals has been accomplished.

This work has not reached its culmination. There is no doubt that at least 25 per cent of the population of the average mental hospital can be maintained in extramural care with great advantage to all concerned.

Fears at times have been expressed of possible dangers to communities that might result from the practice of a liberal policy of extramural care of mental patients. Such fears are quite groundless, as has been shown by a recent New York study. It appeared from that study that the proneness toward criminal behavior exhibited by paroled patients over a period of years was equal to one-fourteenth the corresponding proneness of a comparable sampling of the unselected population.

#### HEREDITY AND GENETICS

The recent gains in our knowledge of genetic factors in the etiology of mental disorders have resulted mainly from investigations of such disorders occurring in monozygotic twins. In such investigations dizygotic twins and siblings with mental disorders are generally utilized as control material.

Only a few of the rarer forms of neuro-psychiatric disease are produced solely by hereditary factors: Huntington's chorea, the various types of amaurotic family idiocy, and probably a minority of the cases of the higher grades of mental deficiency.

Not heredity, but damage to the ovum, caused by factors which are in positive correlation with the age of the mother, is the cause of mongolism. All the heretofore reported observations of this condition in twins indicate that if one of a pair of monozygotic twins is a case of mongolism, the other of the pair is also invariably affected; but if one of a pair of dizygotic twins is a case of mongolism, the other of the pair is invariably free from it.

Among the commoner groups of mental disorders none is produced solely by genetic factors; their etiology is complex, with genetic factors playing a more or less important part.

Manic-depressive psychoses have been consistently shown, by statistics of both singly-born and twin subjects, to be "the most hereditary" of the commoner psychoses. In monozygotic twins with such psychoses there is concordance of findings, *i.e.*, both twins of the pair affected, in 69.6 per cent of the cases. The corresponding figure for the so-called schizophrenic psychoses is 61.0 per cent; and for epilepsy it is but 52.2 per cent. The remainder of the etiologic complex of manic-depressive breakdowns seems to consist mainly of emotionally upsetting psychogenic factors.

It should not be necessary in this connection to labor the point of the heterogeneity of the group of the so-called schizophrenic psychoses. It seems possible to separate out from this group, at least roughly, a subgroup characterized, in contrast with the remainder of the group, by onset after 30, higher incidence in the female sex, and evidence of a relatively greater part played by genetic factors in the etiology. Here, apparently, genetic factors determine an abnormal sexual make-up, leading sometimes, perhaps under the influence of improper upbringing, to repression, unconscious internal conflicts, and ultimately to hallucinatory and delusional trends with overt or symbolic sexual content.

A quite unexpected by-product of the psychiatric researches of twins has been the finding of the importance of cerebral birth trauma in the etiology of vast groups of neuropsychiatric conditions—an importance heretofore never adequately appraised. The

principal conditions concerned are: infantile cerebral palsy, epilepsy, mental deficiency, deteriorating psychoses of childhood and adolescence ("dementia praecox"), grave behavior difficulties of childhood which often progress in the direction of chronic delinquency and criminality, and various combinations of these.

In the etiology of cerebral birth trauma two principal groups of factors are involved: traumatizing factors originating in the obstetrical situation, and factors determining the degree of vulnerability of the child's cerebral tissues. There are many factors in the second group, and among them, very definitely, a hereditary vulnerability. In cases of abnormally high degree of cerebral vulnerability any of the above-listed conditions may be produced even in the course of

approximately normal labor. This finding holds a full explanation of the frequently noted phenomenon of "dissimilar heredity" which has puzzled students for generations. The occurrence, in a given family, of individuals afflicted now with epilepsy, now with mental deficiency, now with juvenile delinquency, now with an early deteriorating psychosis, is presumably to be explained, in each respective case, by the severity, extent, distribution, and localization of the brain injury produced at birth.

The literature on this subject in the past two or three years has been extremely meager. For a fairly complete list of references the reader is referred to: Rosanoff, A. J., Handy, L. M., and Plessert, I. A.: The etiology of mental deficiency with special reference to its occurrence in twins, *Psychol. Monogr.*, 48, No. 4, 1937.

## EDUCATIONAL AND INDUSTRIAL PSYCHIATRY

By FRANKLIN G. EBAUGH, M. D., AND CHARLES A. RYMER, M. D., DENVER, COLO.

### EDUCATIONAL PSYCHIATRY

Within the past year there has been continued recognition of the need of improving the teaching of psychiatry in the undergraduate, graduate and postgraduate levels. Contemporary world events enhance the importance of psychiatric education in the medical schools together with the promotion of industrial and military psychiatry.

Psychiatric education logically falls into three major categories—undergraduate, graduate and postgraduate education. Progress in these three has not been parallel but advances have been made in all. The first organized survey of psychiatric education was made in 1932 under the auspices of the National Committee for Mental Hygiene and progress since has been recorded in the *Journal of the American Medical Association*, the *Journal of American Medical Colleges*, the *American Journal of Psychiatry* and other medical publications. A summary, "Psychiatry in Medical Education" is being published by the Commonwealth Fund and will be ready for distribution early in 1942. The authors (F. G. E. and C. A. R.) are impressed with the confusion which seems to characterize this branch of the undergraduate

medical curriculum, due, they believe, to lack of carefully formulated ideas as to the purpose and rôle of courses in psychiatry. One has the feeling that not a few courses in psychiatry, especially in the preclinical years, have been added to meet certain standards rather than because of any clear-cut recognition of a need for these courses or of their proper relationship to the rest of the curriculum.

The chief difficulty in the teaching of psychobiology arises from the fact that the concept, method and purpose of this course are not clearly formulated. The very diversity of the material presented in courses on normal behavior is evidence that teachers have not been able to make up their minds about the content of psychobiology. The resultant teaching is characterized by hazy statements and failure of integration with the other first-year subjects. Too often psychobiology is presented as a series of didactic lectures upon unrelated items. Even given better teachers, ideas as to content and methods must be developed and proved through experiment and by conferences for comparison of results.

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framework around which psychobiology can be built. *Personality factors* should be investigated objectively. The personality study is in a sense the laboratory work of the course; it offers the student an opportunity to gain a good deal of self-knowledge and insight into his own difficulties. The privilege should always be extended of confidential conferences regarding any personal problems of students.

One of the handicaps of teaching psychobiology is lack of agreement as to terminology, and uniformity of definition of the terms used.

What is wrong with the teaching of psychopathology? First, the failure to realize that psychopathology should include a study of the mechanisms of abnormal behavior, rather than merely a delineation of clinical types and the classification of syndromes. Nor is psychopathology synonymous with abnormal psychology which is too limited in its scope to serve the needs of the medical student.

Too often the curriculum has failed to include previous instruction in normal behavior. The logical relation between abnormal and normal behavior is difficult to demonstrate when the student lacks an objective, sound understanding of what constitutes normal behavior. In such a situation it is small wonder that the instructor in psychopathology often turns quite openly to the presentation of clinical psychiatry.

Again the teaching of psychopathology is too often entirely didactic—a static presentation of mental reactions. The opportunity for the student to practice the methods of the psychiatric examination is underemphasized or neglected entirely. Such practice by the student does more than any one thing to convince him that the objective study of mental processes is possible.

What is wrong with the teaching of clinical psychiatry? In addition to the lack or inadequacy of teaching facilities and the abuse of the didactic method, perhaps the most widespread weakness in the clinical years is poor supervision of the student's work on the wards and in the clinics. More and better trained teachers and greater interest in providing the preceptor type of instruction are the remedy.

Therapy is still inadequately taught in many schools. There are two possible explanations: first, the persistence of the early point of view that mental diseases are scarcely amenable to treatment, and second, the relative intangibility of treatment methods. The fine nuances of technique in handling intricate personal problems can be learned only through prolonged experience and painstaking personal instruction. Because of the difficulties involved some psychiatric educators question whether therapy *can* be taught; whether it is not entirely a matter to be gained by intuition and protracted personal experience. Other educators believe that the process is so complicated that it is scarcely feasible to undertake in the short time available. However, excellent courses in psychiatry which include the fundamentals and techniques of therapy are given in a few schools; one of the important developments for the future must include better teaching along this line. Otherwise the student is left with a feeling that the whole matter of mental disease is too complicated for any but the expert and that psychiatry really has little to do with the average run of patients. In this connection, it is worth while to emphasize therapy in psychosomatic medicine to undergraduates, thus calling attention to the importance of the psychiatric implications of cases commonly seen by the general practitioner. The somatic manifestations of psychic disturbances are often more easily traced in these cases, and the simpler methods of psychotherapy more easily demonstrated.

Effective teaching procedures include the careful demonstration of case material, with emphasis upon therapeutic measures, and the repeated presentation of cases to show the results of therapy.

While it would be desirable for the intern to spend a part of his service in a psychiatric hospital, this is generally impractical and he can gain much through attention to psychosomatic medicine during his internship. Consultation and liaison teaching and the inclusion of psychiatric facilities within the general hospital are probably the best means of remedying neglect of psychiatric instruction during the intern year. The possibilities for development in this field are scarcely

touched, and it will probably be a long time before adequate psychiatric training in the intern period is an accomplished fact.

Graduate and postgraduate training is hampered by the same difficulties as undergraduate training; but it must be remembered that graduate teaching as we know it is of relatively recent origin. Planned courses for the specialty practice of psychiatry were formerly unheard of; the graduate of a medical school who was interested in mental disease served as a physician in an insane asylum, but little thought was given to his training or supervision of his work. Following his residence in the state hospital for an unspecified period, he was considered to be a neuropsychiatrist. Even today some hospitals offer an unsupervised one-year residency designed for specialty training. Good one-year residencies have an important place in certain training programs, but can hardly be adequate preparation for the specialty practice of psychiatry. Even residencies of two or three years in institutions approved by the Council on Medical Education and Hospitals offer no guarantee of adequate training. Too often, the "residency" consists simply of a period spent at an institution without the benefit of an alert, conscientious teaching staff. The routine aspects of the work predominate and little or no encouragement is given to teaching activity or research. The designation of physicians as "residents" in large institutions which provide little or no active training should be discontinued. In particular, we recommend that the need for adequate supervision be more fully recognized and provision made for better organized teaching programs.

In postgraduate education we need extended and better opportunities for "refresher" courses and for the presentation of new techniques so that the physician may have the opportunity of reviewing at fairly regular intervals the fundamentals of psychiatry and of keeping abreast of progress in this field. These courses are of two kinds: those for the general practitioner or specialist in other fields and those for the psychiatrist. In addition, there is always need for highly specialized training for the well-equipped psychiatrist who wishes to gain certain specific techniques. This training is usually in

the nature of intensive apprenticeships in some recognized center.

The standards set by the American Board of Psychiatry and Neurology have done much to improve graduate and postgraduate psychiatric education and no doubt will result in increasingly higher criteria for certification. Even this agency can reach a higher level of performance by discontinuing the certification of men on the basis of their records only, without examination, and by no longer permitting the candidate to be conditioned in the same subjects more than once.

The challenge to offer "refresher" courses in psychiatry has partially been met by the organization of postgraduate psychiatric institutes for the state hospital men sponsored by the Committee on Psychiatry in Medical Education of the American Psychiatric Association and financed by the Rockefeller Foundation. Thus far four institutes have been held. Approximately 400 hours of instruction have been given to a total average audience of 205 men.

Postgraduate work has been undertaken by several medical schools, and it is gratifying to know that sufficient recognition is being given psychiatry to make postgraduate work a necessity.

#### INDUSTRIAL PSYCHIATRY

Industrial psychiatry has been given great impetus through the efforts of Dr. Lydia Giberson who has pioneered in her attempt to acquaint business men with the need to understand personality variations in the work-a-day world. She has outlined industrial psychiatry as a phase of preventive medicine which aims to detect and forestall serious mental and emotional maladjustment among industrial employees and to bring the benefits of modern psychiatry and neurology to the broad mass of working America.

Giberson states that psychiatry in general operates along four lines: (1) Custodial. (2) Therapeutic. (3) Preventive, which includes preclinical diagnosis; control of industrial and social factors to forestall mental breakdowns; setting up tests for differentiation of mental and emotional types; coordination of all facilities to insure mental and emotional health. (4) Directional, which

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aims at shaping of environmental factors to promote mental and emotional stability; offensively in the production of propaganda for enemy consumption, and defensively for the establishment of morale and efficiency. Industrial psychiatry may operate on all these levels except the first, and may be made effective through education of employees, management of industrial physicians, family

physicians, family, social service workers and above all the public.

The important rôle which industrial psychiatry is to play in the next few years has been sensed during the past year. The National Research Council through its Committee on Neuropsychiatry has set up a sub-committee on "Personal Relations in Industry" with Dr. Giberson as chairman.

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## REPORT OF THE SPECIAL SUB-COMMITTEE ON SECTIONS OF THE AMERICAN PSYCHIATRIC ASSOCIATION<sup>1</sup>

### INTRODUCTION

Prior to 1927, in the proceedings of the Association, the various scientific sessions are sometimes referred to as "Sections," numbered serially. Senior members of the Association, who look back with an understandable nostalgia for those earlier and more intimate years, still think of a "Section" in those terms. They feel that the development of a group of formally organized subdivisions of the Association has destroyed the unity of the Association as a whole. Your committee feels that although this regret is natural, it is based upon a misconception. The first Section of the Association was organized in 1927, the second and third in 1933, the fourth in 1935. Since 1927, the total membership of the Association has grown from 1282 to 2667. It must be obvious that the type of unity of feeling and of informal intimacy which can be achieved in a body of 1282 is no longer possible in an Association which has doubled in size and which is still growing. The expanding range of psychiatry in medicine, and its ever widening application to human affairs have made this growth inevitable.

Therefore, your committee feels that subdivision into smaller units is the only way possible to recapture unity and the informal intimacy that once was characteristic of the Association as a whole, and that the natural lines of cleavage along which such divisions will develop are fields of special scientific interest, of special technical procedures and problems, and of specialized areas of practical application.

### I. HISTORICAL NOTE

A. In June, 1927, the National Association for the Study of Epilepsy became part of The American Psychiatric Association, and in so doing a Section on Convulsive Disorders was formed. (Amer. Jour. Psych. Vol. 7, No. 2, Sept. 1927, pp. 288-289.)

B. In May, 1933 the Council of the Association acted favorably upon the application of a body of Members and Fellows of the Association for the

<sup>1</sup> This report was presented by Dr. Kubie, chairman of the special sub-committee on sections, at the meeting of the Council of The American Psychiatric Association in New York, Dec. 20, 1941.

As this important subject will come up for further discussion and action at the Boston meeting, it is desirable that the Fellows and Members familiarize themselves with the report and its recommendations.

The chairman of the special sub-committee will be glad, in the meantime, to receive comments, criticisms and suggestions from the membership of the Association.—EDITOR.

formation of two further sections: to wit, a Section on Psychoanalysis, and a Section on Forensic Psychiatry and Conduct Disorders. This action was taken under Article 6 of the By-Laws of the Constitution, a revision of which was approved at that same meeting.

The Council recommended, however, that the approval of these new sections *should be limited to a trial period of three years*, "the continuation of the sections beyond that period of time to be contingent upon the petitioning by the sections for such a continuation and upon the approval of the Council and of the Association." (Amer. Jour. Psych., Vol. XIII, No. 2, Sept. 1933, p. 381.)

These recommendations of the Council were approved by the Association. As far as can be discovered in the record, however, neither the Section on Psychoanalysis, nor the Section on Forensic Psychiatry and Conduct Disorders has ever petitioned the Council for continuation. Therefore, technically speaking it would seem that neither section exists at present. Both are ambulatory corpses of the legally dead.

C. In 1934, Dr. Arthur P. Noyes, as chairman of a special committee, reported to the Council of the Association a set of regulations to govern all sections of the American Psychiatric Association. (Amer. Jour. of Psych., Vol. 91, Sept. 1934, No. 2, p. 441.) These regulations were accepted by the Council and by the Association at its meeting in New York on May 30, 1934. (Amer. Jour. of Psych., Vol. 91, Sept. 1934, No. 2, pp. 369-370.)

Under these regulations each section is specifically empowered "to make by-laws for its own government, provided that they shall in no way conflict with the Constitution and By-Laws of the American Psychiatric Association or with the regulations governing sections of the Association. These by-laws would become effective upon approval by the Council of the Association." (Amer. Jour. of Psych., Vol. 91, Sept. 1934, No. 2, p. 381.) The discussion of this issue had been initiated at the meeting of the Executive Committee in New York, on October 21, 1933, and is reported in the proceedings of that Committee. (Same volume, pp. 402-403.) The regulations, as finally enacted, deviate in certain respects from the previously existing statutes of the Constitution and By-Laws; and it would appear that the sections are still operating under the original By-Laws of the Association rather than under the later regulations which should have superseded them.

In general the regulations recommended by Dr. Noyes and accepted by the Association, but never fully implemented, can be summarized as follows:

(1) The officers of each section shall consist of a chairman, vice-chairman and secretary, to be elected annually. Together with 2 annually elected committeemen they would constitute the *Executive Committee* of the section.

(2) Any Fellow or Member of the Association may apply to be admitted to any section; but *only such applicants for membership in a section as shall be approved by this executive committee, shall be eligible for membership.*

(3) A member of the Association may be a member of one section only.

(4) Only Fellows of the Association shall be eligible for the office of chairman, vice-chairman, or secretary of any section. (This limitation was modified in 1936, to apply only to chairmen.)

(5) The scientific sessions of all sections shall be open to all Fellows, Members and invited guests of the Association; but only the members of any section may vote at the business meetings of that section.

(6) Each section is responsible for the organization of its own program, through a committee appointed by its chairman, and cooperating with the Program Committee of the Association.

(7) Each section shall hold annual meetings at the time and place of the annual meeting of the Association, but may upon approval of the Council have additional meetings at other times and places.

(8) No dues shall be charged to members of any section; but members may be assessed for unusual expenses, subject to the approval of the Council and Association.

(9) Each section may make its own by-laws, provided that these do not conflict with the Constitution and By-Laws of the Association. Such by-laws become effective only after approval by the Council of the Association.

This instrument was formally accepted by the Association (Amer. Jour. of Psych., Vol. 91, Sept. 1934, No. 2, pp. 441-442), but never has been carried out fully.

D. In May, 1935, in Washington, the Council received a petition requesting the establishment of a Section on Mental Deficiency. Presumably this petition was approved; although the facts are not clear from the record. (Amer. Jour. of Psych., Vol. 92, Sept. 1935, No. 2, p. 442.) At any rate the President-elect of the Association was requested to appoint temporary officers for this new section.

E. At the same meeting, Dr. Noyes presented a report by a special committee on sections, of the Committee on Standards and Policies: Dr. Arthur P. Noyes, chairman, Dr. James V. May, Dr. William L. Russell. (Amer. Jour. of Psych., Vol. 91, Sept. 1934, No. 2, pp. 482-484).

This sub-committee reviewed the history of the development of the American Psychiatric Association, stressed the desirability of organizing "a limited number of sections dealing with more highly specialized psychiatric interests," and made it clear that it had in mind primarily the fields of specialized scientific inquiry within the realm of psychiatry. With this in view it recommended the approval of the organization of a new Section on Mental Deficiency, but recommended the disapproval of the organization of a Section on Administration, "in order that the unity of the Associa-

tion may not be jeopardized by a multiplicity of sections, and since it seems particularly desirable that the scientific work of the Association be kept constantly to the fore."

F. In 1936, the provision of the By-Laws of the Constitution that both the chairman and the secretary of a section should be Fellows of the Association was modified in the sense that the status of Fellow was pre-requisite only for the chairmanship of a section. No mention is made of vice-chairman or of the members of the executive committee provided for by the regulations. (Amer. Jour. of Psych., Vol. 93, Sept. 1936, No. 2, p. 416.)

In this same issue of the proceedings of the Association is contained the only record of the business proceedings of any sections. On pages 428-434, inclusive, appear brief notes on the proceedings of the Sections on Forensic Psychiatry, Convulsive Disorders, and Mental Deficiency. There are no published proceedings of the Section on Psychoanalysis.

It will be noted that the provisions of the regulations which had been adopted by the Association in 1934, were not accurately enforced in any recorded election. Especially noteworthy is the fact that not one of the three above mentioned has at any time had the prescribed executive committee (consisting of a chairman, vice-chairman, and secretary, plus two elected members) functioning as a membership committee to determine the eligibility for membership of applicants for membership in the section. The recorded proceedings of the Association do not indicate whether or not the Section on Psychoanalysis has been conducted in closer accord with existing regulations.

G. Apparently between the years 1936 and 1940, the Council of the Association has had no occasion to consider any special problems concerning the sections. In 1940, however, the Council reconsidered these questions, as the result of suggestions reaching it from various Fellows and Members. (Amer. Jour. of Psych., Vol. 97, Sept. 1940, No. 2, page 408.) These suggestions, together with other problems relating to the sections, were first referred to the Committee on Psychiatric Standards and Policies, under the chairmanship of Dr. Frederick W. Parsons (Am. Jour. of Psych., Vol. 97, Sept. 1940, No. 2, p. 464). Subsequently, however, your special sub-committee was appointed consisting of Dr. L. S. Kubie (chairman), Dr. Walter Bromberg, Dr. Oscar J. Raeder, to be assisted and counselled by Dr. Frederick W. Parsons and Mr. Austin Davies. (Amer. Jour. of Psych., Vol. 98, No. 2, Sept. 1941, p. 273.)

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This summarizes briefly the history of the problem up to the present time. It has been difficult to document these data because of several facts.

(1) The record of various discussions of the problems are scattered through the proceedings of the Association as a whole, its various committees and its Council. (2) Many details of procedure are

omitted from these records. (3) On only one occasion are the proceedings of the business meetings of the sections themselves recorded along with the proceedings of the Association as a whole.

Despite the incompleteness of the available data, it seems to your Committee that it is probable that the sections have never been clearly apprised of the rules and regulations under which they are supposed to function, with the consequence that they have operated in only partial conformity with the regulations of the Association. Your Committee points this out because it believes that certain of the problems which have been presented to it for consideration can be taken care of merely by carrying into effect the existing regulations.

## II. RECOMMENDATIONS DESIGNED TO ELIMINATE EXISTING CONFUSION AND AMBIGUITY CONCERNING THE PRESENT STATUS OF THE SECTIONS

A. A printed leaflet describing the plan of organization of sections should be prepared for circulation to all Fellows and Members.

B. This leaflet should also set forth the scope and purpose of each existing section, and its requirements for membership.

C. In conformity with the requirements of existing regulations each section should be requested by the Executive Secretary of the Association to elect a chairman, vice-chairman, and secretary, who together with certain additional members should form an executive committee.

Under the existing regulations, the executive committee of each section has two chief functions: the evaluation of the qualifications of new applicants for membership, and the selection of the program for the forthcoming year. Under the existing regulations, this executive committee consists of five officers, each elected annually for one year: to wit, the chairman, vice-chairman, secretary, and two specially elected members.

To your committee, this method of selecting an executive committee seems wholly undesirable, because it fails to ensure any continuity in the management of the affairs of the section. Furthermore, it is quite likely that as sections grow such a committee would become seriously overburdened with administrative tasks.

Therefore, your committee recommends that the executive committee of the sections shall consist as before of a chairman, vice-chairman and secretary *ex-officio*, each to be elected annually, and of four ex-chairmen of the section, *ex-officio*. That is, each chairman upon retiring from office shall automatically become a member of the executive committee of the section to serve for four years. Such a system as this would seem to provide for continuity and at the same time for rotation and change in the management of the affairs of the sections.

D. Each section should be duly notified that it is the duty of this executive committee to pass on the eligibility of any Fellow or Member of the

Association who applies for membership in a section.

E. The Sections on Psychoanalysis and on Forensic Psychiatry should be requested to legalize their status by applying to the Council for the continuation of their respective sections.

F. The Executive Assistant of the Association should be directed to publish annually a brief summary of the proceedings of the business sessions of each section of the Association, after the published proceedings of the Association. To this end, specific instructions should be issued to the secretaries of all sections to keep adequate minutes on these proceedings, to submit the minutes to the executive committees of their respective sections for approval, and upon receiving such approval to file a summary of these minutes with the Executive Assistant of the Association for publication in the *AMERICAN JOURNAL OF PSYCHIATRY*.

G. Since under the statutes and regulations governing the sections of the Association, each section is empowered to have its own by-laws (provided that these do not conflict with the Constitution and By-Laws of the Association, and provided that they have been approved by the Council of the Association), it is suggested that the secretaries of the several sections be required to file their governing regulations with the Executive Assistant of the Association.

H. Since under existing regulations each section is *required* to establish minimal qualifications and criteria for membership in its own section, these qualifications should be registered with the Executive Assistant of the Association, and should be made available to all members of the Association by publishing them annually together with the proceedings of the section. To this end, the secretary of each section should be requested to forward annually to the Executive Assistant of the Association a copy of the minimal requirements for membership, together with any changes which may from time to time be made in these requirements.

I. In the annual booklet of the Association the sectional memberships of each Member or Fellow of the American Psychiatric Association should be indicated by the use of appropriate initials after each name, and at the end of the full list of members a list of active voting members of each section should be appended.

J. It is felt that the present restriction of membership to one section serves no purpose, and should be eliminated.

K. In order fully to legalize the present status of all existing Sections, their officers and regulations, your committee recommends:

(1) That the Council should recognize at once as legal defacto officers of these Sections, all officers who were elected at the last annual meetings of these Sections in Richmond in May of 1941;

(2) And further, that in order to insure the legality of the proceedings of these Sections at the meetings to be held in Boston in May of 1942, these defacto officers of each Section should be asked to send to the Executive Assistant of the American

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Psychiatric Association a list of the voting members of their respective Sections, in order that the Secretary of each Section may receive from the Executive Assistant an official list of such voting members before the forthcoming meetings.

### III. RECOMMENDATIONS CONCERNING FUTURE POLICY

In an effort to explore the opinion of the membership of the Association and of the various sections, your Committee issued a short questionnaire, a copy of which is appended to this report. This questionnaire was sent to approximately 100 members of the Association, sampling the membership as widely as possible. On most issues the answers received showed an unexpected uniformity; although to the basic question of the advisability of having sections at all, the answers varied from the opinion that there should be no sections, to a plan completely to subdivide the Association into sections so that all meetings would be section meetings except for an opening and closing session of the Association as a whole.

As a result of its study of the replies to these questionnaires, as well as its study of the problem as a whole, your Committee has arrived at certain basic principles concerning the problem of sections which it hereby presents to the Council for consideration:

1. The inevitable and continuing increase in its membership forces the Association to form a certain number of sections, in order to maintain high standards of scientific work, to perpetuate the traditional good fellowship among members, and to provide forums for free, informal and detailed discussions such as can never take place in large scientific gatherings.

2. These sections should represent: (a) special fields of scientific interest and experience, (b) special scientific technique, (c) special fields of practical and social applications of psychiatry.

3. The scientific sessions of every section should be open to every Fellow, Member and invited guest of the Association (cf. Sect. I., Regulation 5, above); and in order to eliminate misunderstandings it is important always to make special mention of this fact in every printed program, and at the opening session of the Association's annual meetings.

4. As an administrative unit within the Association, the primary function of each section should be the careful selection of a program of papers of high excellence and the exclusion of papers of lesser merit. These critically selected programs will offer to the members of the Association at large the opportunity to hear and participate in expert informed discussion of every special aspect of psychiatry.

A second purpose of the sections may at times be to organize cooperative and coordinated research.

5. The officers who, under the regulations of the Association (cf. Sect. I, Regulation 6, above) have the responsibility both for the organization of the

program and for all other scientific activities of the sections, are elected by the members.

6. Therefore, in order that these officers should be chosen wisely, it is essential that active voting membership in each section should rest on special scientific qualifications, the nature of which in each instance must be determined by the section itself with the approval of the Council of the Association.

7. In establishing criteria for active voting membership, each section should clearly specify (a) the minimum number of years of special experience which is considered prerequisite for membership, (b) the type and duration of special training required.

8. Your committee makes two subsidiary recommendations with regard to membership in sections. In the first place, although membership in a section of the American Psychiatric Association can never be made contingent upon membership in any other organization, nevertheless it should be the established policy of the Association that the qualifications for membership in any section should never drop below those maintained by other recognized scientific organizations representing the same field before the country. Secondly, it seems desirable that each section set up a category of honorary memberships, for individuals who may not meet the qualifications for active voting membership but who represent a special interest in the field in question.

9. Both to assist the several sections in carrying out their work and for purposes of general information, it is desirable that active voting membership in a section should be indicated in two ways in the annual booklet of the Association; (a) by appropriate initials, or a key number, after the name of each member in the general membership list, and (b) by listing in the back of the annual booklet the active voting members of each section.

### IV. THE SCOPE AND TITLE OF EXISTING SECTIONS

A. The scope and title of the Section on Convulsive Disorders is sufficiently clear and needs no alteration.

B. The scope and title of the Section on Psychoanalysis is clear and needs no alteration.

C. The Section on Mental Deficiency was organized in 1935, in order to increase the interest of the members of the American Psychiatric Association in the problem of mental defects, and to bring into closer rapport the institutional worker and the child psychiatrist of social agencies, schools and private practice. It is felt that the full understanding of the psychopathology of childhood is hampered by the artificial gap which exists both in the training and in the experience of these two groups.

Unfortunately the very name of the section has tended to limit it to the institutional workers, of whom there are relatively few in the body of The American Psychiatric Association. There have never been enough valuable papers specifically on mental deficiency to fill a program; and from the

first an effort has been made to include papers on general child psychiatry. (Between 1936 and 1940 nine such papers have been published from the section in the *AMERICAN JOURNAL OF PSYCHIATRY*.) Nevertheless, the fact remains that the section is failing to perform its essential liaison function. Therefore it would seem wise to change its name so as to indicate the broader scope which was planned for it.

To call it the "Section on Child Psychiatry" would be simple, and logically adequate. Unfortunately, however, the connotations of this term as currently used do not include the field of mental deficiency; so that in an organization with this name the institutional physician would feel himself at a disadvantage. To place the interests of the latter definitely on a parity with those of the "child psychiatrist," the section might be called the "Section on Mental Deficiency and Child Psychiatry." This again would be descriptively accurate; but its very name would tend to perpetuate the distinction between the two fields which the section is aiming to eliminate. A third alternative would lay stress on the scientific rather than the practical therapeutic interests of the section, and might avoid the drawbacks of both of the above-mentioned names. This would be to call it the "Section on Psychopathology of Infancy and Childhood." This would include embryogenesis, the development of behavior, neuropathology of childhood, experimental observations on infancy and childhood, all grades of mental deficiency, emotional disturbances, the neuroses and psychoses of infancy and childhood, educational difficulties, and the special organizational and administrative problems of schools, institutions and homes for all kinds of children at all ages.

Your committee favors the latter appellation for the section; feeling that in the long run it will help to draw in those who are interested in children from every psychiatric angle. It recommends that this suggestion be referred back to the section in question for consideration.

D. The Section on Forensic Psychiatry finds itself circumscribed by the strict implications of this title, and the members of this section therefore wish to change its name so as to indicate a broader scope. The section will present to the Council its own recommendations on this matter.

#### V. THE FORMATION OF NEW SECTIONS

In psychiatry as in all medical sciences, interest in various special aspects of the science fluctuates sharply. From time to time certain members of the Association occupy themselves exclusively with one technique or one particular field of application. These may gradually become part of the permanent structure of the science, may drop out and disappear, or may persist but with a separate rôle and a separate personnel with special types of training and experience.

Clearly it would be unwise to form sections for those special interests which prove to be ephemeral; but for all enduring fields of special interest the organization of the Association should provide a

forum in which those who concentrate their activities can meet, exchange their experiences, criticise one another's work, and present their several fields before the Association as a whole. In the past, these needs have been met either by informal round table discussion groups, or by the formation of sections. Your Committee recommends that this practice be continued and expanded, and that the two should be correlated in such a way that the formation of new sections should always grow out of the less formal round table groups.

Specifically your committee recommends that the following general procedure be adopted: that if a round table has been held for five consecutive years, and if during those five years it has attracted an increasing audience, of whom at least 25 individuals have attended for at least three consecutive years, that the 25 Fellows and Members of the Association who have formed this consistent nucleus of the round table shall be entitled to apply to the Council of the Association for the formation of a new section.

Your committee would also present for your consideration an alternative plan, embodying three steps in the transition from a round table to a section. (a) From among the subjects represented by all of the papers submitted at any annual meeting, the Council of the Association, conjointly with the Program Committee, should select a series of topics for special round table discussions. (b) From among these round table discussions which prove to be most successful and most often recurrent, the Council of the Association and the Program Committee would be empowered to select certain subjects as suitable for special symposia, and further to select a panel of experts to organize the programs of these symposia. (c) Such a special panel should be empowered to circularize the membership, calling for papers and contributions on the special field of the symposia, instead of waiting for the chance that valuable papers in any field might be submitted concurrently. (d) Finally, from among those symposia which prove to be of lasting and recurrent interest, sections could be formed on the application of 25 active participants in the symposium and with the consent of the Council.

Your committee can best illustrate the possibilities of either of these plans by listing the following groups of topics in which round table discussions could be organized, some of which might ultimately lead either directly or indirectly via symposia to the formation of new sections.

- (a) Experimental neuroses.  
Comparative psychology.  
Animal psychology.  
Conditioned reflex.
- (b) Experimental observations on infancy.  
Infant development.  
Physiology of infant development.
- (c) Chemistry and physiology.  
Chemistry of the central nervous system.  
Nutritional disorders in psychiatry.  
Vegetative nervous system in the neuroses and psychoses.

- (d) War neuroses.  
Morale problems.  
Economic and cultural influences.  
Comparative anthropology in the neuroses.
- (e) Shock treatments.  
The surgery of psychiatry:  
1. Experimental.  
2. Clinical.
- (f) Electrophysiology of the nervous system.  
Electroencephalography.  
Chronaxie.
- (g) Personality test methods.  
Projective techniques: Rorschach, Szondi,  
etc.  
Methods of rapid personality evaluation.  
Mass methods.  
Psychological sampling methods.  
Statistical methods.
- (h) History of psychiatry.
- (i) Problems in hospital administration, organization  
and personnel.

Your committee feels that this procedure might well be tried out by inaugurating at once a series of round tables and/or symposia in certain of these fields: e.g., history of psychiatry, experimental neuroses, personality test methods.

## VI. SECTION MEETINGS

(1) Most members of sections feel that under ordinary circumstances two meetings are adequate for any section. Many suggest that the number of meetings should be flexible and should depend upon the number of papers in the field which are offered in any particular year. Practically all agree that it is undesirable to hold section meetings before the formal opening of the annual meeting of the Association. Therefore, several suggest that the *opening meeting of the Association* should occur on Monday morning, that the formalities of presidential addresses and addresses of greetings should take place at the dinner of the Association, and that all daytime hours should be reserved for scientific sessions except for the necessary executive sessions. To your Committee these suggestions seem valuable.

(2) Your committee also feels that it would be definitely advantageous to scatter the section meetings irregularly through the days of the convention, and to vary their distribution from year to

year. In one year, Section "A" might meet on Monday morning, and Tuesday afternoon, on Monday afternoon and Wednesday afternoon in another year; on Tuesday morning and Thursday morning in a third year, etc. In this way the members of any section would not always be barred from participation in and attendance at the meetings of certain other sections or of the Association as a whole. Fixed schedules tend to emphasize the segregation of the membership of the Association into section units; whereas a fluid schedule with a shuffling of meetings and a rotation of favored positions would tend to minimize any such tendency towards segregation.

## VII. FINANCES OF THE SECTIONS

The sections exist for the good of the Association as a whole, even though for the proper exercise of their function in the Association voting membership in them is limited to those who have special qualifications. The expenses of the sections, therefore, are a just and fair responsibility of the treasury of the whole Association. Within a month after the annual spring meeting, the executive committee of each section should be asked to submit to the Council of the American Psychiatric Association a budget for its work for the coming year. This budget should be met from the treasury of the Association; after approval by the Council.

In the event that the expenses of a section exceed its budgetary appropriation, either because of an underestimate of its running costs, or because of unexpected and unpredictable demands upon its funds, it may apply to the Council for an additional appropriation, or with the approval of the Council it may assess its own members to meet this deficit.

*Signed: THE COMMITTEE:*

LAWRENCE S. KUBIE, M. D.,  
*Chairman,*  
WALTER BROMBERG, M. D.,  
OSCAR J. RAEDER, M. D.

At the meeting of the Council of The American Psychiatric Association in New York, December 20, 1941, the Council voted to approve at once recommendations E and K (under section II). The Council took this action in order to remove any doubt as to the legality of the status of the existing sections and their officers.

## PROGRAM

### NINETY-EIGHTH ANNUAL MEETING OF THE AMERICAN PSYCHIATRIC ASSOCIATION, BOSTON, MASS.

MONDAY MORNING, MAY 18, 1942<sup>1</sup>

9.30 A. M.

#### Division 1. Section on Convulsive Disorders:

1. The Problem of the Vasomotor Phenomena in Epileptics. Felix Frisch, M.D. (by courtesy), and Albert W. Pigott, M.D.
2. Experimental Production of Acute and Chronic Jacksonian Seizures. Lenore M. Kopeloff, Ph.D. (by courtesy), S. E. Barrera, M.D., and Nicholas Kopeloff, Ph.D. (by courtesy).
3. Concerning the Psychogenesis of Convulsive Attacks. Leo H. Bartemeier, M.D.
4. A Review of Brain Pathology in the Convulsive Disorders. R. L. Dixon, M.D.
5. Anatomic and Pathologic Considerations in Convulsive Disorders. R. W. Waggoner, M.D., K. Scharenberg, M.D. (by courtesy), and R. W. Howell, M.D.
6. Convulsive Disorders and The Automobile Driver. Lowell S. Selling, M.D.
7. Porencephaly in Institutional Epileptics. Samuel M. Weingros, M.D. (by courtesy), Thomas S. P. Fitch, M.D. (by courtesy), and Albert W. Pigott, M.D.

#### Division 2. Section on Forensic Psychiatry.

#### Division 3. Morale and Military Psychiatry:

1. Social Data in Psychiatric Casualties in the Armed Services, By Alexander Simon, M.D., St. Elizabeths Hospital, Washington, D. C. and Margaret Hagan, Field Director, American Red Cross, Washington, D. C. 15 minutes.
2. Morale, By Edward A. Strecker, M.D., and Kenneth E. Appel, M.D., The Institute of the Pennsylvania Hospital. 15 minutes.
3. Analysis of Draftees Discharged for Neuro-Psychiatric Disability, By Wilfred Bloomberg, M.D., of the Boston Army Induction Board. 15 minutes.
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5. A Course in Military Psychiatry, By Roy Halloran, M.D., and Paul I. Yakolev, M.D., Metropolitan State Hospital, Waltham, Mass. 15 minutes.
6. The Psychiatric Social Worker and the Selective Service Boards, By Miss Marion McBee, Secretary of the New York City Mental Hygiene Society, and George S. Stevenson, M.D., National Committee for Mental Hygiene. 15 minutes.

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MONDAY AFTERNOON, MAY 18, 1942

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1. The Psychiatric Program of the U.S. Navy, By Commander U. H. Helgesson (M.C.) U. S. N. R.
2. The Neuropsychiatric Selection of Recruits, By Lieut. C. L. Wittson (M.C.) U. S. N. R., Lieut. H. I. Harris (M.C.) U. S. N. R., and Ensign M. Jackson (H.V.) U. S. N. R.
- A. Facilities and Procedures.
- B. The Rapid Individual Psychiatric Examination.
- C. Brief Test for Intelligence.
- D. Social Service Aspects, By Pauline Peters, A.R.C. and Alice M. Fellows, A.R.C.
- E. Typical Case Material.
- F. A Statistical Analysis.

TUESDAY MORNING, MAY 19, 1942

9.30 A. M. TO 11 A. M.

#### Division 1. Psychosomatic Medicine:

1. Emotional Factors in Organic Diseases of the Central Nervous System, By George Wilson, M.D. of Philadelphia, Pa. 15 minutes.
2. Psychosomatic Interrelationships Studied by Experimental Hypnosis, By Milton H. Erickson, M.D., Eloise Hospital, Eloise, Mich. 15 minutes.
3. Personality Factors in Muscle Disease, By Herbert S. Ripley, M.D., Charles Bohnen-gel, M.D., and Ade T. Milhorat, M.D., New York Hospital. 15 minutes.
4. Psychiatry in a General Hospital with Special Reference to the Relationship between the Complaint Problem and Mental State, By Robert A. Matthews and Baldwin L. Keyes, from Philadelphia, Pa. 15 minutes.

#### Division 2. Shock Therapy (A. Electric Shock):

1. Electric Shock in the Treatment of Schizophrenia and Other Mental Disorders, By Clarence A. Neymann, M.D., Vladimir Urse, M.D., and John Madden, M.D., Cook County Hospital, Chicago, Ill. 10 minutes.
2. Electric Convulsive Therapy in Schizophrenia, By Lothar B. Kalinowsky, M.D. and Harry J. Worthing, M.D., Pilgrim State Hospital, Brentwood, New York. 10 minutes.
3. Electric Shock Therapy in the Extramural Treatment of the Psychoses, By Louis Wender, M.D., Hillside Hospital, Bellerose,

- L. I., Benjamin H. Balser, M. D., from the New York State Psychiatric Institute, New York City, and David Beres, M. D., from the Hillside Hospital. 10 minutes.
4. Sub-Convulsive Electric Shock Treatment of the Psychoses, By W. A. Thompson, Rockland State Hospital, Orangeburg, N. Y. 10 minutes.
  5. Electric Sub-Convulsive Shock Therapy of Psychoses Associated with Alcoholism, Drug Addiction and Syphilis, By N. J. Berkowitz, M. D., University of Minnesota Medical School. 10 minutes.
  6. Electric Shock Therapy, By Joseph Epstein, Pinewood, New York. 10 minutes.
  7. Continued Study of Electric Shock Therapy. Further Treatment and Followup Study, By Lauren Smith, M. D., Donald Hastings, M. D., and Joseph Hughes, M. D., Institute of the Pennsylvania Hospital. 10 minutes.

## Division 3. Neurological Problems:

1. Symmetrical Granular Atrophy of the Cerebral Cortex of Vascular Origin, By Andrew J. Akelaitis, M. D., University of Rochester School of Medicine. 15 minutes.
2. Imperception of Impaired Somatic Functions and Parts of the Body in Organic Brain Lesions, Josef Gerstmann, New York City. 15 minutes.
3. Prefrontal Lobotomy in Chronic Psychosis, By Magnus C. Petersen, Willmar State Hospital, and H. F. Buchstein, Minneapolis, Minnesota. 15 minutes.
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II A. M.

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- Business Meeting.  
Presidential Address.

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2. Psychosomatic Relationships in Senile Psychoses, By William Malamud, M. D., William Freeman, M. D., J. M. Zucker, M. D., Worcester State Hospital, Worcester, Mass. 20 minutes.

3. The Psychiatric Approach to Physical Disease (With Special Reference to the Gastro-Intestinal Tract), By Rupert A. Chittick, M. D., McLean Hospital, Waverly, Mass. 20 minutes.
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1. Followup Study of Patients Treated with Insulin, By Earl D. Bond, M. D., Pennsylvania Hospital. 10 minutes.
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6. The Use of Shock Therapy in 350 Mental

Hospitals, By Lawrence Kolb and Victor H. Vogel, U. S. Public Health Service. 10 minutes.

**Division 3. Miscellaneous Topics:**

1. The Significance of the Nautical Theme in the Art of Children, By Lauretta Bender, M. D. and William Q. Wolfson, A. M., New York University College of Medicine. 20 minutes.
2. Graphic Rorschach II: The Graphic Rorschach as a Clinical Instrument, By Gregory N. Rochlin, Kate N. Levine, and Joseph R. Grassi, Fairfield State Hospital, Conn. 15 minutes.
3. History of the First Psychopathical Institution on the American Continent, By Samuel Ramirez Moreno, M. D., Mexico City. 20 minutes.
4. The Dawn of Psychiatric Journalism, By M. K. Amdur, M. D., Veterans Administration, Coatesville, Pa. 20 minutes.
5. Electroencephalographic Studies in 100 Cases of Gastric Ulcer, Sidney Rubin, M. D., Bellevue Hospital. 10 minutes.
6. Pulmonary Tuberculosis Among Patients at Anoka (Minn.) State Hospital, 1934 to 1941, By Walter P. Gardner, M. D. 15 minutes.

**TUESDAY EVENING**

**ROUNDTABLES**

1. The Treatment of Alcohol Addiction. Moderator, Robert Fleming, M. D.
2. Applications of Psychoanalysis to the National Emergency. Moderator, Harry Stack Sullivan, M. D.

*Note:*—Other roundtables will be announced in the final Program.

**WEDNESDAY MORNING, MAY 20, 1942**

9:30 A. M.

**Division 1. Section on Psychoanalysis:**

1. Concepts of the Neuroses Attributed to War, By A. A. Brill, New York City.
2. Psychological Observations in Affective Psychoses Treated with Combined Psychotherapy and Convulsive Shock Therapy, By Roy Grinker, M. D. and Norman Levy, M. D., Michael Reese Hospital.
3. Shock Therapy in Schizophrenia, By Leland Hinsie, M. D., New York, (Tentative).

**Division 2. Geriatrics:**

1. Psychopathology of Aging, By O. Diethelm, M. D. and Fred V. Rockwell, M. D., New York Hospital. 20 minutes.
2. The Toxic Delirious Reactions of Old Age, By G. Wilse Robinson, Jr., M. D., Neurological Hospital, Kansas City, Mo. 20 minutes.
3. The Treatment of Involutional Psychoses with Estrobene, By Eugene Davidoff,

M. D., E. C. Reifenstein, Jr., M. D., and Gerald L. Goodstone, M. D., Syracuse Psychopathic Hospital. 20 minutes.

4. An Evaluation of Treatment for Senile Psychosis with Vitamin B Complex, By G. L. Wadsworth, E. Quesnel, E. C. Murphy, M. Gerson, V. Fish, and Mr. P. Nogee, Rhode Island State Hospital. 10 minutes.
5. Follow Up on 100 Ambulatory Depressed Patients after Fourteen Years, By Lloyd H. Ziegler, M. D., Milwaukee Sanitarium and Philip H. Heersema, M. D., Mayo Clinic. 20 minutes.

**Division 3. Psychosomatic Medicine:**

1. The Spirogram (Respiratory Tracing) in Psychiatric Disorders, By Jacob E. Fine-singer, M. D., Massachusetts General Hospital, Boston, Mass. 20 minutes.
2. Psychological Anorexia, By John A. Rose, M. D., Bowman Gray School of Medicine, Winston-Salem, N. C. 20 minutes.
3. Studies of the Relationship Between Emotional Factors and Rheumatoid Arthritis, By Ralph M. Patterson, M. D., James B. Craig, M. D., Raymond W. Waggoner, M. D., and Richard Freyberg, M. D., The Neuropsychiatric Institute and University Hospital, Ann Arbor, Mich. 20 minutes.
4. Measure of Susceptibility to Nervous Breakdown, By W. Horsley Gant, M. D., Phipps Psychiatric Clinic, Baltimore, Md. 20 minutes.
5. Diagnostic Difficulties and Metabolic Changes in "Functional" Mental Disease, By L. J. Meduna, M. D., F. J. Braceland, M. D., and John Viachulis, Ph. D. 20 minutes.

**WEDNESDAY AFTERNOON, MAY 20, 1942**

2 P. M.

**Section 1. Joint Session of the Section on Psychoanalysis and the American Psychoanalytic Association.**

**Section 2. Section on Schizophrenia:**

1. A Study of Malnutrition in Chronic Schizophrenia, By Crawford N. Baganz, M. D. and James M. Norris, M. D., Veterans' Administration, Lyons, New Jersey. 20 minutes.
2. Clinical Analysis of Schizophrenic Deterioration, By Otto Kant, M. D., Worcester State Hospital. 20 minutes.
3. Relation Between Personality Type and Clinical Sub-Type of Schizophrenia, by Andras Angyal, M. D., Worcester State Hospital. 20 minutes.
4. A Study of the Prognosis in Schizophrenic-Like Psychoses in Children, By Reginald S. Lourie and Bernard L. Pacella, New York State Psychiatric Institute and Hospital. 20 minutes.
5. Clinical and Biological Interrelations between Schizophrenia and Epilepsy, By Paul H.

Hoch, New York State Psychiatric Institute. 20 minutes.

**Section 3. Miscellaneous Topics:**

1. The Musician's Point of View Toward Emotional Expression, By Howard Hanson, 20 minutes.
2. Methods of Estimating Capacity for Recovery in Patients with Manic-Depressive and Schizophrenic Psychoses, By Edwin P. Gildea, M. D. and Evelyn B. Man, Yale University School of Medicine. 20 minutes.
3. Body Image Concepts of Prostitutes, By Frank J. Curran, M. D. and B. Frank Vogel, M. D., Bellevue Hospital. 20 minutes.
4. Criteria for Psychoses, By George S. Sprague, M. D., Sprague's Sanitarium, Lexington, Ky. 20 minutes.
5. Recreation as an Aid to the Community Life of the Mental Hospital, By John Eisele Davis, Veterans Administration, Perry Point, Md. 15 minutes.

WEDNESDAY EVENING, MAY 20, 1942

ANNUAL DINNER

THURSDAY MORNING, MAY 21, 1942

9.30 A. M.

**Division 1. Section on Mental Deficiency.**

**Division 2. Therapy:**

1. Transference and Counter-Transference in Psychotherapy, By Emeline P. Hayward, M. D., New York City. 20 minutes.
2. Psychosynthesis of Amnesia, By George D. Weickhardt and K. H. Langenstrass, Saint Elizabeths Hospital, Washington, D. C. 20 minutes.
3. Time Element in the Treatment of Drug Addiction, By M. J. Pescor, P. A. Surgeon, U.S. Public Health Service Hospital, Lexington, Ky.
4. The Total Push Method, as Applied to an Acute Service in a Mental Hospital, By Dr. B. A. Thompson, Veterans Administration, Lake City, Florida.
5. Experimental "Neurosis" and "Psychotherapy," By Jules H. Masserman, Chicago, Ill. 20 minutes.

**Division 3. Social Science:**

1. Psychiatry as a Social Science, By Gregory Zilboorg, New York City. 20 minutes.
2. The Rôle of Rural Socio-Satural Factors in the Functional Psychoses, By Nathan Blackman, M.D. and Seymour G. Klebanoff, M. D., Clarinda State Hospital, Iowa. 20 minutes.
3. What Unemployment Does to People, By Sol Wiener Ginsburg, M. D., New York City. 20 minutes.
4. Community Resources as Adjuvants to Psychotherapy, M. Geneva Gray, Ph. D. and Merrill Moore, M. D., Boston, Mass. 20 minutes.

5. A Study of the Dislocation of Children in England in Particular Relation to the Activities of the Psychiatric Social Worker, By Miss Mildred Scoville (By invitation). 20 minutes.

THURSDAY AFTERNOON, MAY 21, 1942

2 P. M.

**Division 1. Schizophrenia:**

1. New Method of Preventive Psychiatry in Public Schools, By Col. H. Edmund Bullis, Executive Director of the Delaware State Society for Mental Hygiene, P. F. Elfeld, M. D., Assistant Director of Mental Hygiene Clinics of Delaware, and M. A. Tarumianz, M. D., Director of Mental Hygiene Clinics of Delaware.

Other papers to be announced.

**Division 2. Miscellaneous Topics:**

1. Organization of a Psychiatric Service in a General Hospital, By Lawrence S. Kubie, M. D., New York City. 20 minutes.
2. Influence of Vitamin E (d-l-alpha-tocopherol acetate) on Blood Cholesterol and Fatty Acids of Male Schizophrenics, By Ralph Rossen and Aaron Reichenberg, Hastings State Hospital, Hastings Minn. 20 minutes.
3. Breakdown in the Earlier Stages of Memorizing, By D. Ewen Cameron, Albany Hospital, Albany, New York. 20 minutes.
4. Psychopathology in Hawaii, By Edwin E. McNeil, M. D., Director of the Bureau of Mental Hygiene, The Queen's Hospital, Honolulu, Hawaii. 20 minutes.
5. Hospital Treatment of Patients with Psychoneurotic Disorders, by Donald M. Hamilton, M. D., Hewitt I. Varney, M. D. and James H. Wall, M. D.

**Division 3. Administrative Psychiatry:**

1. Food Waste as an Administrative Problem, By T. K. Gruber, M. D., and C. A. Hammond, Chef, Eloise Hospital, Eloise, Mich. 20 minutes.
2. Some Administrative Aspects of Suicide in the Mental Hospital, by Louis S. Lipschutz, M. D., Eloise Hospital, Eloise, Mich. 20 minutes.
3. Present Day Mental Hospital Administration, By John L. Van De Mark, M. D., Rochester State Hospital.
4. Organization of a Shock Therapy Unit, By Harry J. Worthing, M. D. and N. J. Bigelow, M. D., Pilgrim State Hospital, New York. 20 minutes.
5. The Problem of the Hospital Maintaining its own Herd of Cows, By Monine Sanger.

Arrangements are being made for Clinical Sessions at the different psychiatric centers in Boston. This will enable members to visit any of the well known psychiatric clinics in Boston and vicinity and attend a clinical conference there in place of one of the three sessions at the Hotel Statler.

## COMMENT

### THE GJESSING AFFAIR

#### NORWEGIAN DOCTORS STAND FIRM AGAINST NAZIFICATION

At a meeting of the Council, and as later reported at a regular session of The American Psychiatric Association during the Richmond meetings, Dr. Adolf Meyer called attention to the case of Dr. Rolv Gjessing, a distinguished psychiatrist of Oslo and director of the Dikemark Insane Asylum, who, according to information received, had been arrested and peremptorily removed from his post and whose present whereabouts were unknown. The incoming secretary, Dr. Overholser, was requested to take the matter up on behalf of the Association with the Department of State and urge that every effort be made to reinstate Dr. Gjessing as head of the Dikemark institution.

It is now possible to give the complete story of this unpleasant affair as submitted by Dr. Karl Evang, Director-General of Public Health of Norway. It is an eloquent tribute to the courage of Dr. Gjessing and to the morale of the medical profession in his oppressed country.

#### This is Dr. Evang's report:

Dr. Rolv Gjessing, internationally known director of Dikemark Insane Asylum, near Oslo, was the center of the German's and Norwegian quislings' first serious effort to Nazify the medical profession in Norway. Through the concerted action of the country's doctors the effort failed, however, and after several tempestuous months Dr. Gjessing was able to resume his position where he is now carrying on without further Nazi interference.

Dr. Gjessing, now 54, has been head of the Dikemark institution since 1929. By developing new methods of examining and treating schizophrenia patients he gained wide recognition among psychiatrists throughout the world.

The "Gjessing affair," as it came to be known, had its beginning in March, 1941, when Dr. Gjessing was informed that a Mr. Wassdahl had been appointed to the important position of head male nurse at Dikemark by the Nazi Surgeon-General of Public Health. Contrary to established procedure the position had not been advertised as vacant, and no effort had been made to solicit applications. Dr. Gjessing, as head of the institution, had not been consulted and had not, in fact, been told that an appointment was to be made.

In Dr. Gjessing's opinion, Wassdahl was not competent to assume the important duties of the

head male nurse at Dikemark—an institution accommodating 800 patients and employing 400 persons. Wassdahl himself was none too sure of his fitness for the post, and for a while seemed perfectly willing to have the appointment rescinded.

It soon became clear, however, that the appointment had been made at the insistence of the Quisling party (*Nasjonal Samling*) of which Wassdahl was a member. When he showed signs of wavering, the party ordered him to insist on fulfillment of the appointment. He did so, declaring that if the duties of the head male nurse were too difficult for him, then those duties would have to be simplified. He admitted, for instance, that he did not regard himself as able to direct the work of 130 subordinates.

In a letter addressed to the Nazi Surgeon-General of Public Health, Dr. Gjessing protested against the Wassdahl appointment. It was not an intemperate letter. He said that he could not personally believe the appointment was due to political influence, but rather that it had resulted from a misunderstanding and "an ignorance of Wassdahl's qualifications."

On April 25th, while Dr. Gjessing was treating a patient, a group of young "hirdmenn" (Norwegian Storm Troopers) forced their way into the room and arrested him. They acted without police authority and carried no warrant. They brought Dr. Gjessing to an Oslo prison and locked him up there. He was released to be rearrested by the German Secret Police. Shortly afterwards he was officially dismissed from his position.

The day after the arrest all the head doctors of the 17 municipal hospitals in and about Oslo met and sent a protest to the Surgeon-General. An excerpt:

"The medical profession in this country has always remained outside political lines or parties. The hospitals have at all times treated patients belonging to all political parties, classes or occupations in the same responsible way. If other considerations than those here mentioned are to determine appointments or promotions at the hospitals, or if capable staff-members at the hospitals are to be dismissed from their positions for purely political reasons, it will result in a definite lowering of the professional standards of the hospitals inasmuch as a number of positions will not be occupied by the best qualified persons.

"This may bring incalculable results. It is unnecessary to remind you that the treatment and work at the hospitals places the greatest demands on professional ability, and that shortcomings in this respect may incur dangerous results for the life and health of patients.

"The head doctors bear the full responsibility

for the work done in their departments—including the work done by subordinate personnel: doctors, nurses or other employees. The head doctors therefore have the right to demand that the authorities make appointments and promotions according to the basic principles mentioned above, so that the work will always be done by the persons best qualified to do it.

"If these basic principles are not followed, then the head doctors cannot assume the responsibility for the operation of their departments."

The head doctors' protest won the unanimous endorsement of more than 2500 other doctors, nurses and hospital employees gathered at a special meeting in Oslo. The Rector of the University of Oslo and several other scholars and scientists joined in the protest.

The "Gjessing affair" was brought sharply to a head when all doctors in Norway threatened to go on strike if Dr. Gjessing were not set free and reinstated as head of Dikemark.

The final outcome was a resounding victory for Dr. Gjessing and the medical profession of Norway. In July it was announced that a Nazi-appointed "investigating commission" had found that Dr. Gjessing's management of the Dikemark Insane Asylum had been "above reproach" and that the "hirdmann" who arrested him had committed an unjustifiable transgression. As Dr. Gjessing resumed his old duties the name and person of Wass-dahl slipped into oblivion.

And while the Nazis have been taking over control of all sorts of trade, professional and even social organizations, they have made no further attempts to molest Norway's doctors.

### PSYCHIATRY AND THE SELECTIVE SERVICE SYSTEM

The JOURNAL notes with regret certain retrogressive changes in the Selective Service System which appear to bode ill for psychiatry.

In October, 1940, as a result of the activities of Dr. Harry Stack Sullivan and the interest of Mr. (now Brig. Gen.) Frederick Osborn, the Selective Service System set up an advisory committee on psychiatry and adopted certain plans for the purpose of orienting the local board examiners, members of medical advisory boards, and Army induction boards to the importance of personality deviations and mental defect in the selection of registrants for military service. Medical Circular No. 1 was adopted and widely circulated; Dr. Dykstra, who for a short time was Director of the Selective Service System, authorized a series of local seminars on practical military psychiatry; a masterly summary of the problem by Dr. C. Macfie Campbell (*J. A. M. A.*, 116: 1883) was reprinted and 18,000 copies were distributed through the Selective Service System; an excellent summary entitled "Consideration of the Registrant as a Person" by Dr. David Rioch (*Psychiatry*, 4: 331-336, Aug. 1941) was reprinted and sent to all members of local boards. At the same time, the Army increased the proportion of psychiatrists on induction boards, with the theoretical aim of providing one for every 50 average daily load of examiners. Circular Letter 19, SGO, was issued, clarifying apparent discrepancies between Selective Service and Army instructions.

Despite gradually increasing difficulties met by Dr. Sullivan, slow progress seemed to be under way until it was suddenly announced last October that beginning about January 1, 1942, local board physical examinations would be discontinued, the whole load to be borne by the Army induction boards. Since then, owing to representations made in high places, pseudo-recantation has taken place, and it is now being intimated that the local boards will be expected to act as "coarse screens," whatever they are, for the purpose of eliminating the "obviously unfit," or "manifestly disqualified."

Quite aside from the fact that the decision to utilize the local physicians who have patriotically given their time to conscientious examinations, merely as a "coarse screen," constitutes a gratuitous insult to the large body of sincere and high minded general practitioners, the JOURNAL submits that the proposed plan is undesirable, unsound and costly.

1. The local boards have readily available the data regarding the medical and social history of the registrant; information about previous mental hospital residences, school records, police records, and a mass of other pertinent data. Further, they have the time available in which to utilize such records, and the ready cooperation of social and medical agencies. They should be encouraged to use such data as an aid to determining mental fitness.

2. A substantial increase in Army induct-

tion boards will be needed. This will entail costly travel for registrants or for boards, as well as a marked increase in outlay for salaries or per diem payments, if civilians are used.

3. It is highly doubtful whether a sufficient supply of trained psychiatrists exists to provide suitable examiners for the increased number of induction boards. Indeed, with the decentralized method of assigning medical officers, there is no assurance that psychiatrists are being used to full advantage on existing boards.

4. With the length of time allotted per man, the induction board examiner will have no time to study the examinee's medical history even if by some freak of organization it could be made available to him by the local board authorities.

5. The cost of neuropsychiatric casualties is staggering. The proposed change threatens

to increase the proportion of unfit selectees, with untoward financial consequences after the war and for a generation thereafter. Furthermore, with the increase in mechanization of the armed forces the actual danger and risk caused by the presence of men who may suddenly become acutely psychotic is far greater than ever before; not only loss of efficiency, but actual danger are sequels of inadequate selection, a fact which is recognized in those countries in which psychiatric selection has not been developed. It is not only ultimately but immediately more costly, and certainly less efficient.

Are we to throw away the lessons learned from World War I? The President has already shown an interest in the value of psychiatry as a means of increasing military efficiency and reducing military casualties. The JOURNAL hopes that he will act to prevent this costly backward step.

#### PHILANTHROPY IN SCIENCE

The National Academy of Sciences was incorporated by Act of Congress, signed by President Abraham Lincoln on March 3, 1863. The Academy is the official scientific advisor to the Government, and is internationally recognized as the leading body representative of science in the United States. The Academy is in touch with scientific developments in this and other countries, and has an organization for reaching and consulting any special group of scientific investigators. Its membership includes 324 leaders in all branches of physical and biological science, elected in recognition of highly distinguished achievements in scientific research.

In 1916, the Academy established the National Research Council primarily to coordinate the non-governmental scientific and technical resources of the country with the military and naval agencies of the Government, in the interests of national security and preparedness. At the end of the war, the Academy reorganized the Council at the request of President Wilson as a permanent organization for the promotion and maintenance of scientific research. Its membership is largely composed of appointed representatives of the major scientific and technical societies of the

country, and includes business men interested in engineering and industry.

At the present time, additional support for fundamental scientific research is urgently required. Yet there has been no single national center especially designed to advise donors to science and to assure them so far as possible that their funds will be conserved and expended wisely and fruitfully.

A three-year study, conducted by a committee of Academy members headed by Dr. Albert F. Blakeslee, retiring President of the American Association for the Advancement of Science, showed clearly that since the early 1930's, financial support of research has been decreasing, and that an authoritative advisory body was needed to assist public-spirited people who wish to make effective gifts to science.

To provide such an advisory and administrative center, the National Academy of Sciences established the National Science Fund in April, 1941. The Academy receives, and the National Science Fund applies, large or small gifts for all physical and biological sciences. The National Science Fund also offers its services as advisor to any prospective donor to science.

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The National Academy of Sciences has its own building at 2101 Constitution Avenue, Washington, D. C. and the principal office

of the National Science Fund is at 515 Madison Avenue, New York City. Inquiries may be sent to either address.

#### THE ASSISTANT PHYSICIAN.

Most of the mentally sick patients who are under medical care are in state hospitals. Because the superintendents of the state hospitals are heavily laden by administrative duties and responsibilities most of the diagnostic and the therapeutic work done in the state hospitals must be carried out by the assistant physicians. The level of the medical work done in the state hospitals in the United States and in Canada constitutes the measure, therefore, of the medical skill of the assistant physicians in those hospitals. Their characters and innate capabilities, their aspirations, their education, their professional training, and their medical and psychiatric experience and their strivings largely afford the criterion of psychiatry in American medicine of today.

It may be possible for a tolerable degree of skill to be exhibited in some of the more mechanistic divisions of the medical art by relatively uneducated physicians. No one can practice psychiatry wholesomely and philosophically and with satisfaction to self and to patient who is not academically well-educated and who is not spaciously trained in medicine and who is not intellectually competent to deal with any patient on the patient's intellectual level.

The assistant physicians of the state hospitals of the several States and of Canada are officials of those political subdivisions. If the assistant physicians are suitable for such service the state should make every effort to retain them throughout the years

of their professional usefulness. The state should quarter them comfortably, and it should afford them continuing opportunities and every encouragement and inspiration to bring their intellectual and professional development up to the limits of their individual capacities. The assistant physicians should have access in the state hospitals to general libraries and to good medical libraries in which the best current medical thought is always available. If possible, the assistant physicians should have opportunities to engage in teaching. They should be encouraged to write and to inform their fellow-physicians by their writings and by clinics about mental sickness and about mental hygiene. It would be well for lay people to obtain their knowledge of mental hygiene from experienced and conservative assistant physicians rather than from some of the sources from which they derive psychiatric misinformation.

Practically all that modern medical science and art have to offer the mentally sick must reach them through the assistant physicians who do the most difficult work in medicine. In the long, difficult years that lie ahead, the care of the mentally sick in our States and in Canada will be largely in the keeping of the assistant physicians of the state hospitals. Do the people realize that? Are the several States conscious of their dependence upon those assistant physicians and of their obligations to them?

J.K.HALL.

## NEWS AND NOTES

**MARSHALL OF THE LORD BALTIMORE PRESS.**—With great regret we record the death, November 4, 1941, of William H. Marshall, a good friend of The American Psychiatric Association since he was a good friend of its official publication. For many years Mr. Marshall guided the printing and publishing of this JOURNAL and by his fine and generous cooperation rendered the work of the editor much easier and more pleasant than it would have been if Mr. Marshall and his associates in The Lord Baltimore Press had regarded their task merely as a matter of business. He was always ready when requested to attend meetings of Council or to come to the Association headquarters for discussion of questions of publication policy, and always he demonstrated the purpose of his House and himself to give the best and most economical printing service possible to provide. In continuous correspondence with the editor, Mr. Marshall could ever be depended upon for helpful suggestions, to answer troublesome questions and to give authoritative information and advice upon any aspect of publication technique. Indeed we often thought of him as a sort of ex-officio member of the editorial staff.

We shall miss Will Marshall. With him however were old and tried collaborators, particularly Mr. Donald H. Reeve and Mrs. N. M. Atkinson, who have long been associated with the production of the JOURNAL. In their hands its fortunes are safe; from them the traditional gratifying cooperation is assured.

**AMERICAN TOUR OF THE SALMON LECTURER.**—Dr. Robert Dick Gillespie, psychiatric specialist of the Royal Air Force and Salmon Lecturer for 1941, returned to England after a month's flying tour of the United States and Canada during which he lectured on war psychiatry in 12 key cities and conferred with the top-ranking Army, Navy and Morale officials in 4 defense centers of this country and Canada.

The British psychiatrist visited this country under the sponsorship of the Salmon Committee on Psychiatry and Mental Hygiene. An extension of his "King's Leave" for two additional weeks was obtained from Sir Harold Whittingham, director general of the medical services of the Air Ministry in London on the joint petition of the Salmon Committee; Dr. Winfred Overholser, chairman of the psychiatric committee of the National Research Council; Dr. James K. Hall, president of the American Psychiatric Association; Dr. C. Macfie Campbell, president of the American Board of Psychiatry and Neurology and Dr. Louis J. Pollock, president of the American Neurological Society, as well as officials of the U. S. War and Navy Departments.

On his arrival in this country Dr. Gillespie went first to Hartford, Connecticut, where he was the guest of Dr. C. Charles Burlingame, chairman of the Salmon Committee on Psychiatry and Mental Hygiene, at a dinner with Governor Robert A. Hurley and the State Defense Council and prominent Connecticut psychiatrists.

The Salmon Lectures opened in New York on Nov. 17 and 18 at the Academy of Medicine with an overflow attendance on both nights. Before each of the New York lectures, Dr. Gillespie was honored at a dinner at the Union Club given by Dr. Burlingame at which Army, Navy and Morale officers, representatives of the British Information Service, officers of the nation's leading psychiatric and neurological associations, professors of psychiatry and neurology from the universities and colleges in the New York area and public officials were present.

The New York lectures were followed by addresses at the University of Toronto on Nov. 19 and at Northwestern University in Chicago, Nov. 21.

In Washington, D. C., Dr. Gillespie held conferences for two full days with military, naval, public health, morale and medical officers representing all branches of military service.

Among the high Army officers with whom Dr. Gillespie conferred were: Major General James C. Magee, Surgeon General U. S. Army; Lt. Colonel Patrick S. Madigan, also of the Surgeon General's Office; Lt.-Colonel David N. W. Grant, director of the medical school at the U. S. Army Air Base at Randolph Field, San Antonio, Texas; Major Lloyd E. Griffis, U. S. Army Air Corps; Colonel George Baehr, chief medical officer, medical division, U. S. Office of Civilian Defense; Lt.-Colonel William C. Porter and Major S. F. Seeley.

Naval officers in conference with Dr. Gillespie were: Rear Admiral Ross T. McIntyre, Surgeon General, U. S. Navy; Captain Charles S. Stevenson, Navy Department; Captain Dallas Sutton, Naval Medical Center, Bethesda, Maryland; Captain Louis H. Roddis, Navy Department; Captain John C. Adams, Navy Department; Commander A. A. Marsteller, Chevy Chase, Maryland; Lt.-Commander Uno Helgesson, Navy Department; Captain Luther Sheldon, Jr., Office of the Surgeon General; Lt.-Commander E. Klein, Bureau of Medicine and Surgery, Medical Corps, U. S. Naval Reserve.

Officials of the U. S. Public Health Service who conferred with the RAF psychiatrist were: Dr. Thomas Parran, Surgeon General of the United States and Director of the Public Health Service; Dr. Lawrence Kolb, Dr. Samuel W. Hamilton and Dr. Victor H. Vogel, all of the Public Health Service; Dr. Justin K. Fuller, Bureau of Prisons Divisions of the Department of Justice and Dr. Robert Felix, Johns Hopkins School of Hygiene and Public Health.

Brigadier-General Frank T. Hines, Administrator of Veterans Affairs of the U. S. Veterans Administration; Col. L. G. Rountree, Chief of the Medical Division of the Selective Service System and Dr. Harry Stack Sullivan, formerly consultant in psychiatry to the Selective Service System were present at the conference.

The State Department was represented by the Honorable G. Howland Shaw, Assistant Secretary of State. Brigadier-General Frederick H. Osborn, Chief of the Morale Branch of the U. S. Army attended, as well as Colonel Taylor E. Darby, Officer in

Charge of the Planning and Research Division of the Morale Branch and Lieutenant Philip Wagner, also of the Planning and Research Division.

Captain Watson B. Miller, Assistant Administrator of the Federal Security Agency and Dr. James A. Crabtree, Executive Secretary of the Health and Medical Committee of the Federal Security; Charles P. Taft, Director of Defense Health and Welfare Services of the Federal Security Agency, were present at the conferences.

The following members of the Committee on Neuropsychiatry of the National Research Council attended the Washington conferences: Dr. Winfred Overholser, director of St. Elizabeth's Hospital, Washington D. C.; Dr. Adolf Meyer, emeritus professor, Johns Hopkins University; Dr. John C. Whitehorn, professor of psychiatry, Johns Hopkins University; Dr. R. Foster Kennedy, professor of neurology, Cornell University; Dr. Tracy J. Putnam, Professor of neurology, Columbia University and Dr. Harry A. Steckel, director, Syracuse Psychopathic Hospital.

While in Washington Dr. Gillespie delivered an unscheduled lecture at St. Elizabeth's Hospital. His next address was given at the Leland Stanford University School of Medicine in San Francisco, California, following which he spoke in Philadelphia, Pennsylvania on Nov. 30 at the College of Physicians Hall.

By virtue of the extension of his "King's Leave" Dr. Gillespie was enabled to continue his lecture tour, although it was impossible to fill the more than 40 requests which poured in from all parts of this country and Canada. On December 3, he stopped in Poughkeepsie, New York, where he addressed the student body of Vassar College. The following day he lectured in Louisville, Kentucky. On December 6, he was the guest of the University of Nebraska Medical College in Omaha, where he spoke before members of the College.

The following day Dr. Gillespie was in San Antonio, Texas, where he conferred with officials of the U. S. Army Air Base at Randolph Field. Lt.-Colonel David N. W. Grant, medical director at Randolph Field, the West Point of the Air, considers the

RAF psychiatrist "the greatest authority in the world on human stress factors in war aviation." From Texas, Dr. Gillespie flew to Pensacola, Florida, for conferences with leaders of the U. S. Naval Air Station there.

On Dec. 11, Dr. Gillespie lectured at the University of Tulane in New Orleans. While in New Orleans, the RAF psychiatrist met the eminent Mexican psychiatrist, Dr. Samuel Ramirez Moreno, professor of psychiatry at the University of Mexico.

Following this address, Dr. Gillespie returned to Canada where he conferred with Air Commodore R. W. Ryan, director of medical services at the headquarters of the Royal Canadian Air Force in Ottawa, Ontario. He also visited the Royal Canadian Air Force Training Field in Toronto, Ontario where he conferred with Wing Commander S. G. Chalk, Principal Medical Officer of the No. 1 Training Command and other Canadian Air officers.

Before embarking on his homeward journey to England, Dr. Gillespie gave a final lecture at the Department of Neurology and Neuro-Surgery of the Montreal Neurological Institute, McGill University, Montreal, Quebec.

It is estimated that in his flying trip across America Dr. Gillespie spent more than 150 hours in the air and that the total number of miles flown from the time of his departure from London until his return would extend once around the world.

It is understood that a "Friend" of the Salmon Committee made this highly important tour through the country financially possible. From the foregoing report it is not difficult to judge how good a friend this anonymous benefactor is. It is fair to say however that without the engineering of Dr. Burlingame, chairman of the Salmon Committee, such a project could not have been carried through. To him therefore the medical profession in the United States and Canada and all who are concerned with military psychiatry owe a debt of profound gratitude.

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**PSYCHIATRIC INTERNSHIPS.**—The psychiatric division of Bellevue Hospital announces a new type of two-year internship

beginning July 1, 1942. There will be twelve two-year internships open to graduates of Class-A medical schools and no previous hospital experience is necessary. It is expected that these internships will give the required year of medicine and surgery so that those who are going on in psychiatry will not have to take a general hospital internship. The first year will consist of six months each in medicine and surgery on the medical and surgical wards of the psychiatric division. The interns on the medical and surgical service will be responsible for the psychiatric work-up of their cases as well as the medical and surgical work-ups. On the medical service the psychosomatic relationship will be stressed and the service will be known as a service in psychosomatic medicine. In other words, the interns will be expected to study the total personality and to work up the case from all angles, including the psychiatric. In the surgical service this same idea will be stressed, particularly in relation to the head injuries where excellent material will be available for more complete study.

During the second year the intern will work on the various psychiatric wards but will continue to utilize his medical and surgical training, will make all necessary physical examinations and carry out medical and surgical procedures on his own ward.

In addition to these twelve two-year internships, there will be four one-year internships which will correspond to the second year of the two-year internships and which will be open to graduates of Class-A medical schools who have had one year of general hospital internship.

Applications for these internships should be made to Dr. Carter N. Colbert, acting director of the Psychiatric Division of Bellevue Hospital, New York, N. Y.

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**DR. LABURT APPOINTED SUPERINTENDENT OF HARLEM VALLEY STATE HOSPITAL.**—Dr. Harry A. LaBurt has been appointed by Commissioner William J. Tiffany, of the State Department of Mental Hygiene, superintendent of Harlem Valley State Hospital at Wingdale, New York, the appointment to become effective December 15, 1941.

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In this position Dr. LaBurt will succeed Dr. John R. Ross who was transferred to Hudson River State Hospital at Poughkeepsie, December 1, 1941.

Dr. LaBurt, a graduate of the medical school of the University of Buffalo (1923), entered the State hospital service in 1924 and has served in the successive grades of positions in the institutions of the State Department of Mental Hygiene. During the past three years he has been first assistant physician of Harlem Valley State Hospital of which he now becomes the head.

**DR. D. EWEN CAMERON APPOINTED MEMBER OF STATE BOARD OF PSYCHIATRIC EXAMINERS.**—Dr. D. Ewen Cameron, neurologist and psychiatrist-in-chief of Albany Hospital, has been appointed by Commissioner E. E. Cole, of the State Department of Education, a member of the State Board of Psychiatric Examiners, the appointment to become immediately effective. Dr. Cameron succeeds Dr. Karl M. Bowman who recently resigned from the Board to accept a position in California.

The Board of Psychiatric Examiners, which is connected with the State Department of Mental Hygiene, is authorized to examine the qualifications of specialists in mental disease and to certify those who meet the requirements as "Qualified Psychiatrists."

**NURSES FOR UNITED STATES CIVIL SERVICE.**—Graduate nurses, both for general staff duty and in psychiatry are required for the Panama Canal Service.

Applications will be rated as soon as practicable after receipt at the U. S. Civil Service Commission, Washington, D. C., and certification made as the needs of the service require. When sufficient eligibles are obtained, the receipt of applications will be closed, in which case due notice will be given.

The entrance salary for nurses is \$168.75 per month. Promotion may be made at the end of the quarter following the first 18 months of service to \$175.00 per month, at the end of the quarter of the succeeding 18 months of service to \$181.25 and thereafter

at such intervals and in such amounts until a maximum rate of \$206.25 is reached, depending upon effective work performance. Such increases come within the terms of the general administrative promotion plan for positions within the scope of the Classification Act of 1923 as amended.

**CINCINNATI SOCIETY OF NEUROLOGY AND PSYCHIATRY.**—At a recent meeting of the Society the following officers were elected: president, Dr. E. A. Baber; vice-president, Dr. A. W. Foertmeyer; secretary-treasurer, Dr. Howard D. Fabling.

At a meeting held at the University Club on December 9, 1941, Dr. Albert B. Sabin discussed congenital toxoplasmosis, a recently recognized disease (internal hydrocephalus, chorioretinitis, cerebral calcification, convulsions, mental retardation and other signs).

**MENNINGER FOUNDATION.**—After several years of planning, the Menninger Foundation was organized and incorporated under the laws of Kansas in April 1941, with headquarters in Topeka. The purposes of this new non-profit psychiatric foundation are fourfold:

1. Provision for psychiatric education, especially the training of young physicians in psychiatry. The shortage of well-trained psychiatrists will presently become acute in relation to the requirements of World War II and the post-war period.
2. Encouragement of research in psychiatric and psychological fields.
3. Making available psychiatric treatment for patients in the low income bracket.
4. Prevention of mental illness, especially through development of child psychiatry and application of psychiatric knowledge to education and child-rearing.

In addition to local officers, the following trustees have been elected: Dr. Winfred Overholser, St. Elizabeth's Hospital, Washington, D. C.; Mrs. Albert Lasker, New York and Chicago; Dr. John C. Whitehorn, Johns Hopkins University, Baltimore; Mrs. Lucy Stearns McLaughlin, Santa Fe, New Mexico; Dean J. Roscoe Miller, Northwestern University Medical School, Chicago; Mrs. Sidney C. Borg, Jewish Board of Guardians, New York City; and George E. Hite, Jr., Milbank, Tweed and Hope, New York City.

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The Menninger Foundation has already initiated several projects from the financial gifts which enabled it to make a modest beginning. Grants have been made for a ten year study of the place of occupational therapy in psychiatric treatment, for a seminar and special Bulletin on Military Psychiatry and the distribution of this information to physicians on the Medical Advisory Boards of the entire country, and for research in the use of hypnosis in emergency psychotherapy and in substantiating newer psychiatric theories. Other projects are to follow.

**FLIGHT AT HIGH ALTITUDES.**—Dr. A. J. Rosanoff, from a review of recent Russian publications, contributes the following item.

In issue No. 3, Volume X, of the Russian Journal of Neuropathology and Psychiatry, B. C. Bamdas discusses certain neuropsychiatric problems in connection with flight at high altitudes. Specifically he reports on the administration of cola and of caffeine for the prevention of certain cerebral symptoms in pilots at high altitudes. The data cited are as follows:

Muscle strength was observed to fall in 57.5 per cent of the cases without medication. When caffeine was used, reduction of muscle strength was observed in only 38 per cent, and after use of cola in only 25.5 per cent of the cases.

Pulse variations within normal limits without medication occurred in 87 per cent of the cases. Following the use of cola they occurred in 69 per cent of the cases, and following the use of caffeine in only 47.5 per cent.

Systolic blood pressure varied to the extent of  $\pm 20$  millimeters in 18 per cent of cases without medication. Following medication with cola such variations occurred in only 2.5 per cent of the cases, and following caffeine in only 7 per cent.

Tendon reflexes were increased following flights both with and without medication, but such increases were more marked in cases without medication.

Latent period of dermographic response remained unchanged in but 16 per cent of the cases without medication. Following cola it was unchanged in 34.5 per cent of the cases, and following caffeine in 47 per cent. Similar data pertaining to pilomotor reactions

also indicate a preservation of normal nervous system responses during flight under the use of these stimulants.

Pseudo-Romberg sign and tremor were comparatively more marked following flights without cola.

The author concludes that these nerve stimulants present certain advantages in flight at high altitudes and that of the two cola has advantages over caffeine.

**DR. STEWART PATON.**—With the passing on January 7, 1942, of Stewart Paton another great name has become part of the tradition of American psychiatry. But traditions have a singular quality of enduring vitality and continue to influence the lives and works of those to whom they belong. The former students and associates of Dr. Paton can testify to the extraordinary stimulus of his teaching and to the constructive part it played in the shaping of their professional and scientific careers. He had been a member of staff at four universities—Johns Hopkins, Princeton, Columbia and Yale. His textbook on psychiatry was the first modern work on the subject in English. His broad outlook and his striving to make psychiatry and mental hygiene socially as well as individually serviceable are indicated by the titles of Dr. Paton's other books: "Education in Peace and War," "Human Behavior," "Signs of Sanity and the Principles of Mental Hygiene," "Prohibiting Minds."

Just a few weeks before his death from a heart attack, in a letter regretting his inability to attend the meetings celebrating the fiftieth anniversary of the Sheppard and Enoch Pratt Hospital where he had been director of the laboratory in the earlier days and where he had made conspicuous contributions to psychiatric education and research, Dr. Paton had uttered these striking words: "Little did we think while we were working in Baltimore of the urgent need there would be of psychiatrists to fight the plague of insanity that now is the greatest menace to nature's experiment of humanizing man."

**SCIENTIFIC EXHIBITS AT THE BOSTON MEETING.**—All those desiring to have scien-

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tific exhibits for the Boston meeting should make immediate application to Dr. S. Bernard Wortis, In Charge of Scientific Exhibits, 410 East 57th Street, New York, N. Y. The Research Committee makes the final selection from the applications received.

**MISSISSIPPI VALLEY MEDICAL SOCIETY 1942 ESSAY CONTEST.**—The Mississippi Valley Medical Society offers annually a cash prize of \$100.00, a gold medal, and a certificate of award for the best unpublished essay on any subject of general medical interest (including medical economics) and practical value to the general practitioner of medicine. Certificates of merit may also be granted to the physicians whose essays are rated second and third best. Contestants must be members of the American Medical Association who are residents of the United States. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society at Quincy, Ill., Sept. 30, Oct. 1, 2, 1942, the Society reserving the exclusive right to first publish the essay in its official publication—the *Mississippi Valley Medical Journal* (incorporating the *Radiologic Review*). All contributions shall not exceed 5000 words, be typewritten in English in manuscript form, submitted in five copies and must be received not later than May 1, 1942. The winning essay of the 1941 contest appears in the January, 1942, issue of the *Mississippi Valley Medical Journal* (Quincy, Ill.). Further details may be secured from Harold Swanberg, M. D., Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Illinois.

**HISTORY OF AMERICAN PSYCHIATRY.**—The president of The American Psychiatric Association, Dr. J. K. Hall, has appointed a special Committee on the History of Psychiatry consisting of the following members:

Earl D. Bond, M. D.  
Clarence B. Farrar, M. D.  
Clements C. Fry, M. D.  
Hugh C. Henry, M. D.  
William C. Menninger, M. D.  
Gregory Zilboorg, M. D., Chairman.

The committee plans to publish an authoritative history of North American Psychiatry under the title, "One Hundred Years of American Psychiatry"—a volume of about five hundred pages which is to be issued at the time of the centenary meeting of the Association in 1944.

The American Association for the History of Medicine took cognizance of the forthcoming centenary and appointed a committee consisting of:

Mr. Albert Deutsch, author of "The Mentally Ill in America."

Professor Henry E. Sigerist, Director of the Institute of History of Medicine, Johns Hopkins University.

Professor Richard H. Shryock, Committee on Research in History of American Medicine, American Association for the History of Medicine.

Gregory Zilboorg, M. D., Chairman.

This committee will give full cooperation to the Committee of The American Psychiatric Association in the preparation of the volume. The two committees will comprise the editorial board of the volume. Funds for the publication of the book have already been raised and turned over to the treasurer of the Association.

A special emblem of the Association will be designed for 1944. It will be selected by means of a competition. Details of the latter will be announced in the near future.

**THE AMERICAN PSYCHIATRIC ASSOCIATION INVESTS IN AMERICA.**—Believing that the promotion of human health and welfare and the advancement of science for which this Association stands can be assured only under the aegis of freedom for which the United Nations are fighting, the Council on behalf of the Fellows and Members has authorized the purchase of \$15,000 in Defense Bonds, and this has been done.

The JOURNAL is happy to report this transaction, knowing that it will receive the hearty endorsement of the 2667 men and women whose names appear on our membership rolls.

## BOOK REVIEWS

**THE TRAUMATIC NEUROSES OF WAR.** By Abram Kardiner, M.D. (New York, N.Y.: Paul B. Hoeber, Inc., 1941).

The purpose in publishing this book, according to the author's statement in the foreword, was to have it serve as "a guide to the study, treatment and post-war care of those neurotic disturbances which are incidental to war."

The topic is without question most timely. Owing to the fact that in this war non-combatants as well as the soldier are subjected to aerial bombardment, the traumatic neurosis promises to be one of the commonest neurotic disturbances in the world.

The approach is made on the premise of a functional rather than an organic etiology and therapy is based upon this assumption but it is admitted that "many factors may contribute to the formation of the traumatic syndrome, organic lesions, self-preservation interests and conflicting ideals."

The psychopathology of the manner in which the symptoms are constructed is discussed in considerable detail.

The emphasis is placed upon the study of the "personality as a whole" and observation focused upon "functional and functioning units and not drives." "These units are either effectual or ineffectual as regards their ultimate purposes for the personality as a whole, and the question as to whether or not they furnish direct evidence of 'instincts' is irrelevant, . . . leading toward a certain kind of effectual adaptation."

A chapter is devoted to a discussion of the symptomatology of the traumatic neuroses with brief description of 24 cases to illustrate the various points made. The author believes a traumatic experience can precipitate any of the well-known types of neurotic or psychotic disorders but claims there are always certain distinctive features of the traumatic neurosis and the presenting symptoms vary according to the time of observation. He divides them, for purpose of discussion, into acute, transitional and stabilized forms.

Sixty-five pages are utilized for the analysis of the symptomatology. Dr. Kardiner draws attention to his observation that the war situation rather colors the intensity of the neurosis than gives it its essential character and that the issue of post-war compensation also conduces to the special character of the chronic forms.

War is an anxiety-provoking situation which strips the individual of the protections of peace-time activity and leads to injury of the individual's adaptation. "What we study, then, in the traumatic neuroses are the new adaptations, which make up the bulk of the symptomatology," hence in this adaptation there appears to be "an organized effort at restitution by continuing the protective devices used on the original occasion of the trauma."

Chapters 4 and 5 which deal with the development of the effective ego and psychodynamics, are exceedingly well done and in great detail follow through the analytical theory of the neuroses generally. We agree with the author that the reader who is interested only in the clinical and practical aspects of the subject can safely delete these chapters.

Part III, comprising unfortunately only 33 pages, deals with the practical aspects of the problem.

Regarding the course of the disorder Dr. Kardiner observes that it "is influenced not only by intrapsychic factors but by a large number of external ones. Generally speaking, the course . . . is likely to be chronic if it serves the patient the use of a secondary conscious or unconscious gain." There can be no disagreement on this score, I am sure. A discussion of prognosis of various types is also included and several paragraphs are devoted to differential diagnosis.

In the chapter on therapy, the author stresses the need for prompt and early treatment before compensation for the neuroses has been instituted. The summary of this chapter is so well done and so important that I believe it is worth quoting *in toto*: "The psychopathology of the traumatic neurosis has taught us that (1) the subject's conception of the outer world; and (2) his conception of his own capacities to deal with it have undergone a profound change. This is effected by a contractile process involving effective resources. The aim of therapy is (1) to revise these reciprocal images of self and outer world to accord with the now actual reality and not with that which prevailed on the occasion of the trauma; (2) to prevent this altered conception of self and outer world from becoming consolidated. Should this take place, the subject will have no choice but to use this new ego organization as the basis of his adaptation. This has serious personal and social consequences.

"This therapeutic objective can be achieved by various means. In acute stages group treatment is possible. It can be done with or without hypnosis. The amnesia is not the cause but a consequence of the defensive process; it should not be made the central focus of the treatment. Amusement, occupational manipulative activity, competitive games should be encouraged. Care must be exercised to separate unresponsive cases for individual treatment.

"Chronic cases present difficult problems in therapy, especially when complicated by compensation. The principles of treatment are the same, but might be aided by hypnosis or sedative drugs."

The social and economic implications of the post-war traumatic neurosis with its many problems are taken up in chapter 8, and some "open questions and future problems" are dealt with in the last chapter.

Dr. Kardiner has without question produced a most valuable treatise on a timely subject.

It, of course, presupposes an acceptance of Freudian views and for a real appreciation of the contents the reader must naturally possess a good understanding of the fundamentals of the psychoanalytical school of thought.

In view of the present National Emergency this book should enjoy a wide circulation and is recommended to all medical officers of the armed forces.

HARRY A. STECKEL, M.D.,  
Syracuse Psychopathic Hospital,  
Syracuse, N.Y.

**THE HYPOTHALAMUS AND CENTRAL LEVELS OF AUTONOMIC FUNCTION.** Proceedings of the Association for Research in Nervous and Mental Disease, December 20 and 21, 1939, New York. Research Publications, Association for Research in Nervous and Mental Disease, Volume XX. (Baltimore, Md.: Williams & Wilkins, 1940.)

These Proceedings consist of 34 articles written on various aspects of hypothalamic structure, function and disorder by men actively interested in these fields of investigation. The editorial board (J. F. Fulton, S. W. Ranson and A. M. Frantz) is to be commended for its successful effort in arranging for a common terminology on hypothalamic and hypophysial structure which has been followed by the various contributors. In the first chapter is given a *précis* of this terminology, with an atlas.

Part 1 also consists of chapters describing in detail embryological development, comparative anatomy, secretory cells, nuclear centres and connections, effects of hypophysectomy and hypophysial stalk resection on hypothalamic nuclei, descending connections, angio-architecture, and measures of vascularity in some hypothalamic nuclei.

In Part 2 of the book is discussed the knowledge of the rôle of the hypothalamus in the regulation of various physiological functions including cardiovascular function, body temperature, water metabolism, carbohydrate and fat metabolism, gastro-intestinal function and sleep. The nature and extent of hypothalamic control of anterior pituitary function and of sexual function and behaviour are also discussed. These interesting discussions provide a valuable review of the current knowledge and also reveal the present ignorance of actual mechanisms of control.

Part 3 consists of a clinical symposium of the hypothalamus. Here are discussed changes in the hypothalamus in organic disease, tumours involving the hypothalamus, personality and emotional disorders associated with hypothalamic lesions, cell changes in hypothalamus in the major psychoses, disturbances of temperature regulation, surgery of the hypothalamic region, autonomic discharge from the stem of the hypothalamus in man and the syndrome of the hypothalamus.

Anyone seeking, in these chapters, for clear-cut signs and symptoms on which to found a diagnosis of definite local disease of the hypothalamus will be disappointed. As pointed out by Bailey, with the

exception of craniopharyngeomas, symptoms definitely of hypothalamic origin are not commonly provoked by tumours in this region until late stages of their evolution; yet the physiological repercussions of lesions in this region are often tremendous and wide-spread. The well known manifestations of thirst and polyuria, obesity, disturbances in genital function, apathy, somnolence and general disturbance of autonomic function, go hand in hand with disorders of personality and emotion. The latter are partly summed up by Alpers in the statement that the hypothalamus is one of a series of stations concerned with emotions principally, and intellect and personality incidentally. Its functions are correlated with the cortex, thalamus and probably lower areas as well. In discussion of medical syndromes, Kennedy urges the correlation of lesions of the hypothalamus with personality changes—with rhythmic fluctuations in mood, behaviour and emotional expression—as well as with the more obvious changes in metabolic function.

R. F. FARQUHARSON, M.D.,  
University of Toronto.

**ELGIN PAPERS.** Volume IV. (Elgin, Ill.: Department of Public Welfare, 1941.)

Fifty years ago Weir Mitchell attacked the mental hospitals of his day as custodial institutions where no attempt was being made to investigate the causes of mental diseases. The same accusations are still thrown at state hospitals by the leading scientific men of today. Cannon recently discussed this problem in his paper on old age, read at the fiftieth anniversary of Stanford University. True as this may be, there are still more and more state hospitals which are becoming centers of research and where more and better work is being done today than in many general hospitals which possess better equipment and larger medical staffs.

These remarks are stimulated by the arrival on the reviewer's desk of the fourth volume of Elgin Papers, which is a presentation of various studies done by the members of the staff of the Elgin State Hospital in Elgin, Illinois. Here, without the benefit of the great foundations, without contributions from large endowments, without the elaborate claptrap of shining laboratories and large animal houses, entirely on their own time, in the course of their hard routine duties, a group of young psychiatrists, under the leadership of an enthusiastic and idealistic superintendent, engages in important scientific investigations. In the introduction Lewis Pollock calls attention to the fact that the staff physicians, with the advice and help of men in nearby universities, have been carrying on important investigations in the fundamental sciences of psychology, physiology, chemistry and pathology which form the background of psychiatry.

There are some 34 papers in this volume, and they cover the whole range of psychiatry. A good deal of the volume is devoted to an evaluation of the new treatments of schizophrenia and correlative studies in the metabolism physiology and pathology

of the brain in connection with these treatments. The reviewer's attention was focussed on some of the papers which happened to interest him, although there are others which may have greater merit.

There is an interesting study by Wittman and Russell, who state that they found no memory defect in their series of cases. It is not altogether true, since the work of Ziskin showed quite conclusively that there is a marked memory defect following an over-treatment with metrazol, and the reviewer himself has recently seen two cases where a marked memory defect followed prolonged treatment with metrazol.

In Gerhard Piers' paper on prognosis in schizophrenia, the author makes an interesting point that patients with strong oral drives, by which he means strong homosexual tendencies with ideas of oral incorporation, may have quite a good prognosis because insulin and a stimulated appetite satisfy the craving of these patients.

Comparing insulin and metrazol, Steinberg and Heilbrunn find that insulin therapy is more effective in patients who are ill less than 18 months. Metrazol is more effective in old, chronic cases. When neither metrazol nor insulin is of any help, a combination of the two may be quite successful.

There is a series of papers on the pathological changes in the brain following metrazol and insulin therapy in animals and human beings. Weil and Liebert find that the same changes take place in human beings as in animals. In both, as a result of shock therapy, they find a shrinkage of the cytoplasm and nuclei of the neurons with hyperplasia and hypertrophy of various types of glia cells.

Pardoll and Bellinson find no benefit from testosterone in the treatment of involutorial states in the male. There are interesting papers on the education of psychiatrists.

The reviewer is struck by the fact that there is a great variability in the quality of the papers. Some are much better than others. It is unfortunate that not all papers have summaries in which the results of the investigation can be clearly stated. This volume and the three previous volumes of the Elgin papers make a valuable contribution to psychiatry, and are also a great tribute to the organizing ability and faith in research of Dr. Charles F. Read.

J. KASANIN, M.D.,  
Mount Zion Hospital,  
San Francisco, Cal.

**BORROWED CHILDREN. A Popular Account of Some Evacuation Problems and Their Remedies.** By Mrs. St. Leo Strachey. (New York: The Commonwealth Fund, 1940.)

This little book of 149 pages is an account of the evacuation of about three quarters of a million unaccompanied children who were evacuated in the first days of September, 1939, from London and some large provincial cities. It is a plain, unadorned tale which gives concrete examples of the difficulties that were encountered in this evacuation. The

book pays tribute to the great devotion, insight and patience of the varied hostesses of the children. Tribute is also paid to the children themselves who, under very trying circumstances, showed such sterling qualities and powers of adaptation. All the familiar difficulties with which child guidance clinics in peace time have to deal were met in the evacuated children and dealt with by a great diversity of persons under the varied circumstances of rural England. Examples are given of the management of bedwetting, anxiety, truancy, morbid fears, pilfering and other symptoms. Frequent reference is made to the general principles of child guidance as outlined by Dr. William Moodie, for many years the head of the London Child Guidance Clinic. The book presents in a vivid way the results of a unique social experiment, and the case material in the book gives useful illustrations of childhood problems which are equally important in time of peace and in time of war.

C. M. C.

**LAS NEUROSIS EN LA GUERRA.** By Gregorio Bermann, M.D. Prologue by Professor Emilio Mira. (Buenos Aires: Aniceto Lopez, 1941.)

This book was written by the former director of the Argentine Mission of Neuropsychiatry and of the neuropsychiatric service of the Military Hospital No. 6 (Madrid), medical commandant of the Republican Army of Spain and titular professor of the Faculty of Medicine of Cordova, Spain.

Dr. Bermann joined the Loyalist forces of Spain in 1937 and was extremely active in organizing the neuropsychiatric services of that army. Thus, both as neuropsychiatrist and administrator, Professor Bermann was in an advantageous position to study the problems of neuropsychiatry relative to modern warfare as they had been demonstrated on the trial battlefields of Spain.

This work was written primarily as a guide to the author's colleagues in the Spanish service. There are, in addition to the prologue by Professor Mira and an appendix, 12 chapters on somewhat rather disconnected material. They deal with the problems of neuropsychiatry of war in the civil and military populations, the nervous disturbances associated with explosion of projectiles, hysteria during war, the physiopathic disturbances, the nervous attacks or crises (epilepsy and hysteria), medical military consideration on hysteria and simulation, emotive neuroses, the neurasthenic syndrome, psychotherapeutic methods during war, psychotherapy in the advanced neuropsychiatric centers close to the front and the psychohygiene of the combatant. The appendix contains several official documents relative to the various aspects of neuropsychiatric disability of soldiers. There is much in the book that is good straight neuropsychiatry applicable in times of peace as well as war. Some parts, such as a number of letters written by various officials and dealing with some titular aspects of neuropsychiatric practice during the Spanish War, are undoubtedly of more local than general psychiatric interest. However, the sections dealing with specific neuropsychiatric disorders are simply and well

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written and to the point with little unnecessary discussion. Many references from the French, Spanish and German literature are included.

One of the main features is the constant insistence upon the importance of political morale in the prevention of neuroses. Numerous figures are presented to show the difference in incidence of neuroses in various military groups depending on such factors as the time when they enlisted in the army, whether they enlisted for definite political ends and with certain political zeal, or had been drafted. The author claims that those groups enlisting earlier in the war, with definite political interests and aims and with zeal, showed much lower incidence of neuroses than did those groups required to enlist at later dates and with less spirit or zeal for the fight. The physician is thus visualized by Berman as performing a function of caring for the whole morale aspect of the individual and not only as caring for his surgical or physical disabilities. To quote, "Neuropsychiatry not only has to realize its specific mission within the medical department but also has to contribute to the spiritual health and elevate the morale of the soldier; to remove undesirable elements from the service; to strengthen those emotionally unstable; to inspire those who attempt to avoid their duty; to support the vacillating; to strengthen the weak; to resolve their inner conflicts and to bring together the combatants in such a way that their common ideals may be furthered." It is thus seen that, in the conception of Dr. Berman, the neuropsychiatrist has a wide significant socio-economic-military function.

The specific disorders discussed in various chapters are presented in a concise, clear manner, often with illustrative case histories and supplemented by frequent references to the literature. Chapters dealing with disturbances associated with the explosion of projectiles, hysteria and simulation are well done. The discussions on the various methods of psychotherapy in war are also well presented and many of the methods are found to be useful. I do not feel that there is anything radically new in the detailed descriptions of the methods of treatment. Most Americans would, in all probability, be fairly familiar with the methods the author recommends, including the establishment of advance hospitals close to the front, with the opportunity of making early diagnosis and thus often aborting more serious disorder with an early return to duty; the use of rest and hypnotics for acute disorders followed by detailed psychiatric observation with intensive reeducation, at times with "persuasion" and finally, in more chronic cases, reeducation with careful psychiatric supervision before return to actual duty.

It is impossible, in a brief review to do adequate justice to the detailed discussions of such problems as, for example, the quick differential diagnosis between hysteria and epilepsy, differential diagnosis of the various types of acute disturbance associated with the explosion of projectiles, etc. Many such questions undoubtedly of great interest in the neuropsychiatry of war, are presented in considerable

detail. It might be highly desirable if a great deal, or at least certain specific portions of this book were translated into English at the present time. The work represents, after all, a report based on intensive individual experience of a qualified psychiatrist with that struggle which ushered in the present world conflict and served perhaps as an experimental laboratory for the problems of present warfare.

S. E. BARRERA, M. D.,  
N. Y. Psychiatric Institute and Hospital,  
New York, N. Y.

#### THE PUBLIC HEALTH NURSE AND HER PATIENT.

By Ruth Gilbert, R.N. (New York: The Commonwealth Fund, 1940.)

The author from her experience as a public health nurse, as well as a psychiatric social worker, has written a comprehensive and well organized treatise on the interpersonal relationships involved in public health nursing.

The variability in nurses' attitudes toward various phases of their work is pointed out and simple psychiatric interpretations as to the reason for these attitudes are given. It is stressed that the nurse must understand herself with her own emotional reactions as well as the patient with his reactions before satisfactory care can be given the sick individual, since the patient's reactions to his present situation and illness are greatly determined by his past emotional experiences and not by the illness alone. Although the care of the sick individual is of primary importance to the nurse, the various individuals in the patient's immediate environment, such as members of the family, neighbors, other agency workers, as well as co-workers in the nurse's own agency, all of whom react to the present situation because of their own past emotional experiences, must likewise be considered because of their influence upon the patient.

Numerous illustrations from the everyday experiences of a nurse's busy life and an extensive bibliography demonstrate the psychiatric implications of the interpersonal relationships involved in nursing.

The author makes no rules such as can be applicable to the handling of specific situations but the many illustrations of the everyday problems with their simple psychiatric interpretations should stimulate the reader to seek a better understanding of the individual in relationship to his illness.

Although the work is written primarily for the public health nurse, it should be of interest as well as help to the young social worker and medical student whose experience in caring for the sick is somewhat limited.

IRMA BACHE, M. D.,  
Boston Psychopathic Hospital,  
Boston, Mass.

#### BEHIND THE SCENES OF MURDER. By Joseph Catton, M.D. (New York: W. W. Norton & Co., Inc., 1940.)

This book is written in a popular and somewhat dramatic style, enriched with liberal direct quota-

tions from murderers and from court records and reports of the author's personal interviews and views. Dr. Catton writes, "Murder often breaks the even tenor of my day's work as a practicing psychiatrist. . . . During my twenty-seven years of practice, crime and the criminal have been among my major interests." The writer takes the reader "behind the scenes" of cases that streamed in headlines across the continent—the case of Winnie Ruth Judd, of William Hickman, of Dorothy Ellingson, the "jazz slayer," of the Massie case in Honolulu. He prepares his case by presenting studies of murderers of many varieties, mostly sane; most of these were examined by him. He includes definitions where they might be helpful to the less well informed.

The book is divided into four parts. In Part 1 he defines murder and raises the question as to whether a major cause of murder may not lie in some of society's own institutions. The author is of the opinion that half of our failure types and criminals are born that way, and that there is little or nothing to be done about it; that parent, teacher and preacher, custom, convention, and law—by omission or commission—make the other half of our maladjusted population. He gives examples of murder in cold blood, in blood warmed by alcohol, homicides in the heat of passion, jealousy, lust, sadism and rage.

In Part 2 he discusses the relation of mental disorder to murder. The attitude of the law and psychiatry toward mental disease and insanity is discussed. The plea of temporary insanity is analyzed. Murders committed in various stages of mental disorder are described as well as killers who feigned insanity—"the insanity dodge," "playing dumb," the "amnesia pretense," alleging delusions, "crazy capers" and "doodling." The question is asked, "Did psychiatry aid the law toward a just disposition of these killers?" Also "Could psychiatric examination at some previous time have recognized the potential killer, avoided the homicide?" He finds that in four or five of the cases, such studies and cooperation of the courts could have prevented the crimes.

In Part 3 the average method of employment of the alienist is outlined and the ordeal of the psychiatrist who appears in court as an expert witness is graphically presented. It is shown that the methods which are used in the cross-examination and the battle between psychiatrist and attorney in court often defeat justice. The fact that the psychiatrist is a human being, and the relation of his emotions to the criminal, the court, science and justice are discussed. Alienist advocates and the use of understanding of the unconscious in getting at the truth in criminals and in the so-called "psychological third degree" are considered.

In Part 4 the various questions and problems are brought into focus. Dr. Catton presents a good case for the wider application of psychiatry in the study and treatment of criminals. It is confessed that psychiatry offers little or nothing towards preventing over half the number of murders which are scheduled for tomorrow. He believes that forty

out of every hundred murders could be prevented if medicine, psychology and sociology were called upon to aid the law; that society is partly responsible for murder in its attitude toward crime in not guaranteeing prompt and just disposition of legitimate complaints of its citizens. Psychiatry is also much to blame insofar as it does not go beyond analysis to treatment. He is convinced that the key to crime prevention is the clinic approach to the study and treatment of individual offenders and giving the clinic a continuing, directing jurisdiction over the offender. He urges that those who are definitely antisocial and who are discovered with reasonable certainty to be the killer type, and also those who are mentally ill and have delusional systems, which include ideas of homicide, should be confined for an indefinite period.

This book constitutes an earnest plea by a psychiatrist of long experience to psychiatry, the law and society, for a more rational, realistic and effective approach to the study, treatment and disposition of the criminal and to the prevention of crime. It represents a sincere and convincing effort to deduce sound conclusions and recommendations from case presentations and clinical and court experience. Much valuable clinical material and data and many very practical suggestions are presented. The explanations and analyses of cases, however, do impress the reviewer as somewhat too simple and open to more comprehensive treatment. This book will therefore hardly contribute much to the seasoned psychiatrist's deeper understanding and comprehension of the criminal and his motivations.

LEROY M. A. MAEDER, M. D.,  
Philadelphia, Pa.

**SEX IN DEVELOPMENT.** By Carney Landis and Co-authors. (New York: Paul B. Hoeber, Inc., 1940.)

The sub-title describes this book as "A study of the growth and development of the emotional and sexual aspects of personality together with physiological, anatomical, and medical information on a group of 153 normal women and 142 female psychiatric patients." The study was made possible by a grant from the Committee for Research in the Problems of Sex of the National Research Council in Washington, D. C. Its object, as stated by Dr. Carney in the preface, was to evaluate the importance of psychosexuality in psychopathology. In carrying out this purpose, the investigators have produced a thoroughly satisfying study, in the best tradition of objective psychology.

Defining *psychosexual* as including "all that is known about the sexuality of the individual anatomically, physiologically, and psychologically," and *psychosexual development* as referring "to the growth and changes in the biological, psychological, and sociological aspects of sex in the course of the life history of the individual," the investigators posed themselves the following questions: "What is the normal (average) pattern of psychosexual development? How do deviations in this pattern affect the adult personality? What were the char-

acteristics of psychosexual development of different types of adult personalities?"

The method used in obtaining the information was that of the controlled interview. The same psychologist interviewed each individual and took down her answers verbatim. The questions had been carefully worked out and the interviewer was skilled in gaining rapport with her subjects and eliciting information.

In addition, the subjects were given a general information inventory which brought out pertinent facts concerning their earlier history, a marriage inventory (44 of the normal and 41 of the abnormal group were married), a general physical and gynaecological examination, a vocational interest blank for women, roentgenological studies were made of the pelvis, and in the abnormal group the psychiatric case study was used. The psychiatric cases were resident in the Psychiatric Institute and Hospital in New York City; the normal group was obtained from women's clubs, adult education agencies, recreational societies, etc., and every effort was made to secure women who would not use the opportunity to secure psychiatric advice for themselves. The age ranges were from 15 to 30 in the normal group, and from 22 to 35 in the psychiatric group. The material obtained was quantified and evaluation scales devised. The book contains an appendix in which the evaluation scales and the interscale relationships are given, as well as the information forms and vital statistics.

The study investigates early childhood, adolescence, adult sex practices, adult personality traits, marital adjustment and physiological and anatomical factors.

The result is a book which answers some questions and raises many more. Only a very few of them can be noted within the limits of a review; the entire book should be read by anyone interested in the personality development of women.

In general, the belief of the psychiatrist that early childhood is an important period in personality development seems substantiated, though traumatic sex experiences, such as aggression at the hands of adults, seem related more to the personality characteristics of the child itself than to the actual experience. The frequency and extent of childhood illness seems rather directly related to psychosexual immaturity, many women never being able to outgrow their childhood dependence. The character of the home, as related to the stability and security it can assure the child, and the direction it gives to his instinctual trends, is the factor upon which his entire development is conditioned.

In adolescence, perhaps, the greatest problem for the girl is her emancipation from the family. Adolescent crushes upon other girls are the norm, and have little or nothing to do with her later heterosexual adjustment. Masturbation is common in the early teens, and usually disappears without having any appreciable effect upon the girl. Excessive masturbation and extreme guilt feelings about the practice occurred more frequently in the abnormal than the normal group.

In adulthood, sexual practices and attitudes varied widely. The abnormal women tended to report

lack of sex feeling or interest more frequently and had found it hardest to break family ties. Thus this attitude would seem to be a part of psychosexual immaturity. These individuals also showed strong sexual affectivity. A small percentage of the group were overt homosexuals. The male body form occurred more frequently in these cases than in the remainder of the group, although the relationship was not constant. Adler's "masculine protest" was evident in the homoerotic group.

Premarital heterosexual intimacies appeared to be a mark of normal healthy development; those reporting them (one out of four married women) had as a rule better sexual adjustment in marriage. Good sex adjustment did not guarantee a happy marriage, nor did its absence correlate highly with unhappiness. A successful marriage has many more angles than the narrowly sexual. Sex adjustment in marriage was definitely poorer in the abnormal than in the normal group.

There were "surprisingly few" anatomical or physiological differences between the normal and abnormal groups. Poor marital sex adjustment occurred in 47 per cent of the women having the anthropoid type of pelvis, as against 10 per cent of the gynecoid type. This relationship was not sustained among the abnormals. The hypoplastic body form was associated with psychosexual immaturity.

It is to be noted that the general pattern of psychosexual development of the psychotic patients differed little from that of the normals. The range of variation in both groups was approximately the same. To quote, "There is a lack of congruity between early attitudes, incidents, and practices of a sexual nature, and the manifestations of the mental disorder." There was, however, as noted above, a suggestion of differences in physical constitution between the normals and the psychotic, the general tendency of the latter being toward hypofunction.

Such are a few of the very suggestive findings from this study. It gives all sorts of leads for further investigations, as well as assurance that some fields have been pretty well worked out. It would appear to be a "must" book for every student of human personality.

WINIFRED RICHMOND, M. D.,  
Saint Elizabeth's Hospital,  
Washington, D. C.

**MEASUREMENT OF EMOTIONAL REACTIONS.** By T. Xoomsai, Ph. D.

**THE RELATIONSHIP OF AFFECTIVITY TO VARIOUS MEASURES OF GROWTH IN CHILDREN.** By May Elizabeth Mecham, Ph. D.

**A STUDY OF PUBESCEENCE IN JUNIOR HIGH SCHOOL BOYS.** By Warren K. Layton, Ph. D.

**THOUGHT AND LANGUAGE IN WHITEHEAD'S CATEGORIAL SCHEME.** By Cornelius Lacy Golightly, Ph. D. (Ann Arbor, Mich.: University Microfilms, 1941.)

These items representing theses for the degree of Ph. D. in the University of Michigan, are available only on microfilm as indicated above. Ab-

stracts of these are obtainable in *Microfilm Abstracts*, Vol. III, No. 2, from University Microfilms, 313 N. First St., Ann Arbor, Mich.

C. B. F.

**PSIQUIATRIA CLÍNICA E FORENSE.** By A. C. Pacheco e Silva, M. D. (São Paulo, Brasil: Companhia Editora Nacional, 1940.)

It will be remembered by those present at the Richmond meeting of the Association that there was also in attendance a distinguished member from Brazil, Dr. Antonio C. Pacheco e Silva, who was fortunately in the United States at the time in the interests of the Brazil-United States Cultural Union of which he is president. Dr. Pacheco e Silva, author of the textbook under review, is professor of psychiatry in the Faculty of Medicine of the University of São Paulo and in the Paulist School of Medicine.

During recent years the Faculty of São Paulo have been laboring on the project of producing a series of textbooks in Portuguese which should not only compare favorably with the standard works imported from other countries but have the added advantages of being more generally accessible and of presenting to students and practitioners conditions as they observe them in their own country and as set forth by their own teachers. From this project has resulted the *Brazilian Medical Library* which already includes eleven practical manuals, four special monographs, eleven treatises or textbooks and other works in special medical fields. The Pacheco e Silva volume is the eleventh of the series of textbooks in this Library. Before publication each work is passed upon by a committee of professors of the Faculty of Medicine of the University of São Paulo whose criteria of approval are: that the work shall be rigorously scientific, that the material shall be correctly arranged and presented and that the language shall be direct and clear. Regarded by his colleagues as one of the most brilliant psychiatrists of Brazil, Dr. Pacheco e Silva has written a book which the committee of the Faculty characterizes as one of the finest of the series of the *Brazilian Medical Library*.

This work of 584 pages has been prepared for both medical and law students. It follows in general the pattern of most modern texts and strongly reflects the influence of Kraepelin. After a brief historical introduction the author discusses the causes of mental illness, without reference to psychogenesis as such, and then proceeds to a description of symptoms, following the usual psychological schema: disturbances of attention, affect, volition,

imagination, consciousness, memory, sense perception, ideation, etc. Special chapters are devoted to constitutional types, psychological tests with particular reference to medico-legal work, psychoanalysis, somatic disorders, general examination methods (without much attention to autognosis and autopatographic data), treatment methods (including fever and shock therapies, the use of vitamins and endocrine products), mental hygiene.

The question of psychotherapy the author dispenses of very briefly. He states: "psychotherapy is one of the most powerful and effective weapons in the hands of the skilful and experienced physician"; and refers the reader to special (not specified) works on the subject. It is true that in a general work such as this detailed psychotherapeutic procedures could not be looked for; unquestionably the author attaches great importance to them, and commensurate to this importance a little more elaboration of general methods which all physicians may use would have been welcome.

The classification of mental disorders adopted by the Brazilian Society of Neurology, Psychiatry and Legal Medicine is not unlike that in use in this country. There are 14 major groupings: 1. psychoses with infections, 2. autotoxic states, 3. heterotoxic psychoses, 4. dementia precox, 5. paraphrenia (chronic systematized hallucinatory delirium), 6. paranoia, 7. manic-depressive psychosis, 8. involutional conditions, 9. organic psychoses and terminal dementias, 10. general paralysis, 11. epileptic psychoses, 12. neuroses, 13. constitutional psychopathies, 14. mental deficiency.

The author devotes special chapters to various medico-legal issues, such as expert evidence, simulation and dissimulation, mental disorders associated with industrial accidents, suicide, testamentary capacity, the care of the criminal insane. These discussions are illustrated by numerous case histories, as indeed are all subjects throughout the book.

Provisions for the care and treatment of mental patients in Brazil are discussed at some length, including various types of hospital public and private, outpatient services, agricultural colonies, family care, social service. It is evident that all aspects of the great social problem of mental illness have been given most careful study and that modern and efficient services suitable to the several types have been provided.

This clear and concise work contains numerous illustrations of patients and also of some of the newer hospitals. It will doubtless be the standard textbook for medical and law students in Brazil as well as for the practitioners of these professions.

C. B. F.

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## IN MEMORIAM

MENAS S. GREGORY

1872-1941

Menas Gregory is dead. The ailing heart, which he never spared, gave up the unequal struggle and he expired on a sun-drenched golf course during what was to have been a pleasant autumnal half-holiday.

Gregory's was a rich, warm, vibrant personality. He knew and was known to the rich and poor, the highly placed and the lowly and though his obsequies were attended by outstanding persons in business and artistic circles, leaders of the bench and bar and many of his professional associates his deepest mourners were the poor and troubled. Uncounted thousands of those who had passed under his influence during his thirty years at the psychiatric department of Bellevue Hospital voiced prayers through many channels, in various languages and by strange rituals when the news of his death shocked those who knew of his ministrations.

The details of Gregory's life, known only to a few, make an absorbing tale. He was born in Syria in 1872. He was orphaned when two, took the name Bulgurian from a relative, but later anglicized his father's name into "Gregory." Though provided with an educational fund he knew domestic insecurity. He lived with various relatives during his childhood and witnessed Turkish atrocities. He attended local schools and had his secondary education in American missionary schools in Syria, there coming under the influence of two American medical missionaries, Drs. Shepard and Montgomery. Inspired by them he determined to become a physician. A Turkish revolution impoverished him but poor, friendless and speaking but little English he came to the United States to achieve his ambition. He entered Albany (N. Y.) Medical College, worked day and night to support himself and was graduated with the class of 1898. He had a period as medical intern in Craig Colony and the Kings Park Hospital, his New York State service lasting from 1899 to 1903, when he was offered a position in the psychiatric

department of Bellevue Hospital of which he became director in 1904. The Bellevue wards devoted to his speciality were shabby, over-crowded, undermanned and the psychiatric work was largely limited to examination for commitment. Justly or unjustly the place was of ill repute.

Gregory changed all that. His administration was forceful, wise and humane and while for many years he had serious structural handicaps with which to contend the work constantly improved and for a generation, without serious criticism or public clamor, he operated that which prior thereto constantly had been in the public prints. He had as interns a thousand physicians and many now leading physicians in their communities had at his hands their first real insight into psychiatry. He saw, dealt with and determined the fortunes of nearly a million persons during his thirty years at Bellevue. Such an administrative problem had to be to a degree autocratic and questions could not be timidly dealt with but his reputation for honesty, integrity and professional fitness was such that few refused to be guided by his decisions.

His days were full but he found time to be professor of psychiatry at the Post Graduate Hospital from 1916 to 1921 and at N. Y. University School of Medicine since 1922. He was consultant in psychiatry at the Neurological Institute. Dr. Gregory was consulting psychiatrist at Fort Ontario, Plattsburg, Camp Dix, Port of N. Y. and at Kingsbridge Hospital during the World War.

He who was never idle claimed that he did not like to work. Then, something internal drove his razor sharp mind into prodigious activity. His little leisure was devoted to gracious living and he enjoyed his apartment which he had enriched by magnificent medieval wood carvings lovingly acquired during brief holidays in Europe.

Dr. Gregory secured from the City of

New York an appropriation of five million dollars to construct a modern psychiatric hospital. This he planned to the last detail. He watched its construction with the greatest interest but it was never fully to be operated by him. He who had given so much of himself to others was summarily removed from his position by a recently appointed superior and Gregory's last years were saddened thereby. Dr. Gregory had a compe-

tence to which he did not need to add but upon leaving Bellevue in 1934 he established an office. He let it be known that he preferred to see only those who could not pay for psychiatric advice. That was Gregory.

Menas Sarkis Gregory, born in Syria in 1872, died in New York November 2, 1941, at the age of 69 leaving, no kin, but a large gap in the lives of many.

FREDERICK W. PARSONS, M. D.